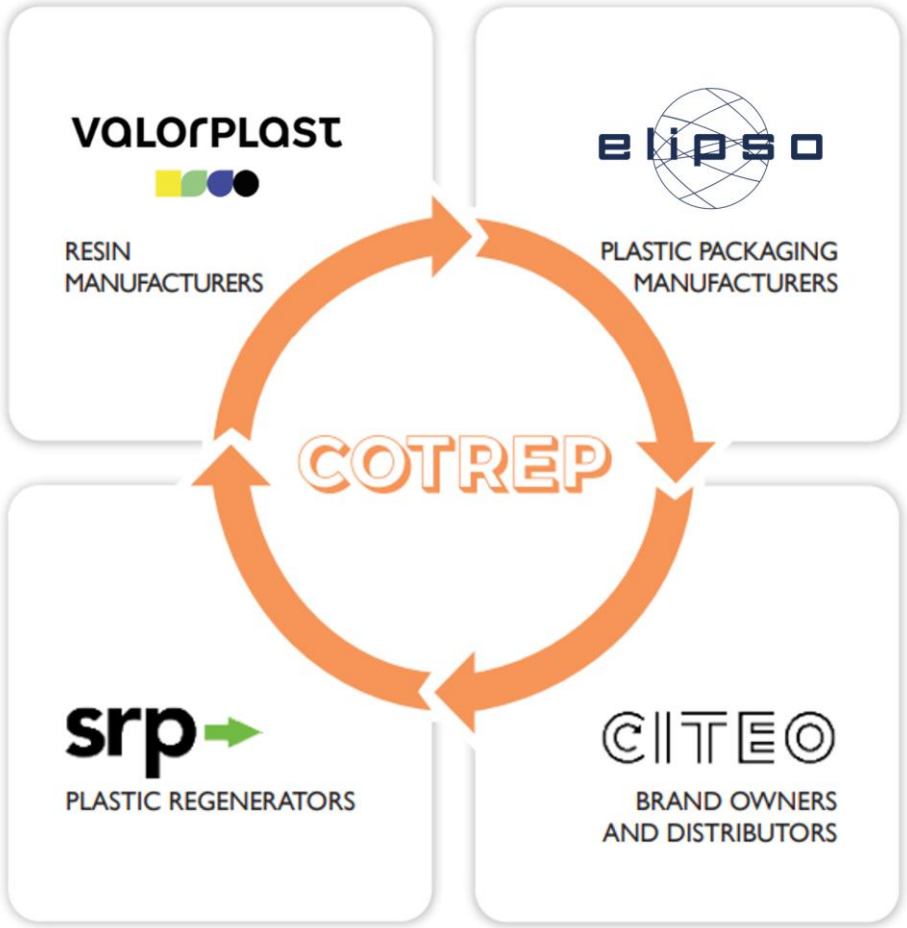
Link to the recording :
https://www.youtube.com/watch?v=_XYkDDSdSic

Webinar COTREP Flexibles PE/PA

16 June 2026

COTREP

The COTREP



Plastic household packaging
In France

Agenda

01
Context and issues around the PA

02
COTREP Testing Methodology

03
New COTREP recommendations

01

Context and issues around the PA

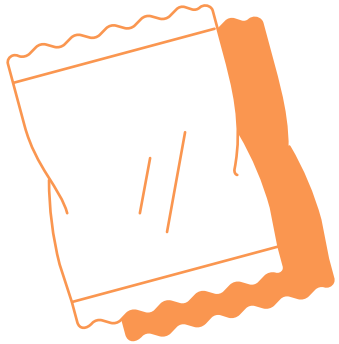
The PA barrier in household flexible packaging in France

Using a PA barrier

20 000 t
Of PE/PA packaging
in fresh markets

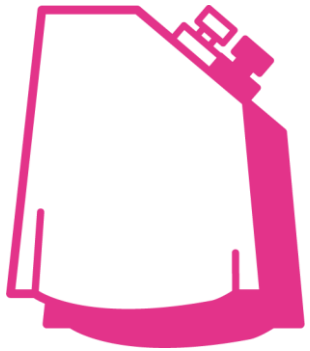
140 000 t / year

Of flexible household packaging
marketed in France

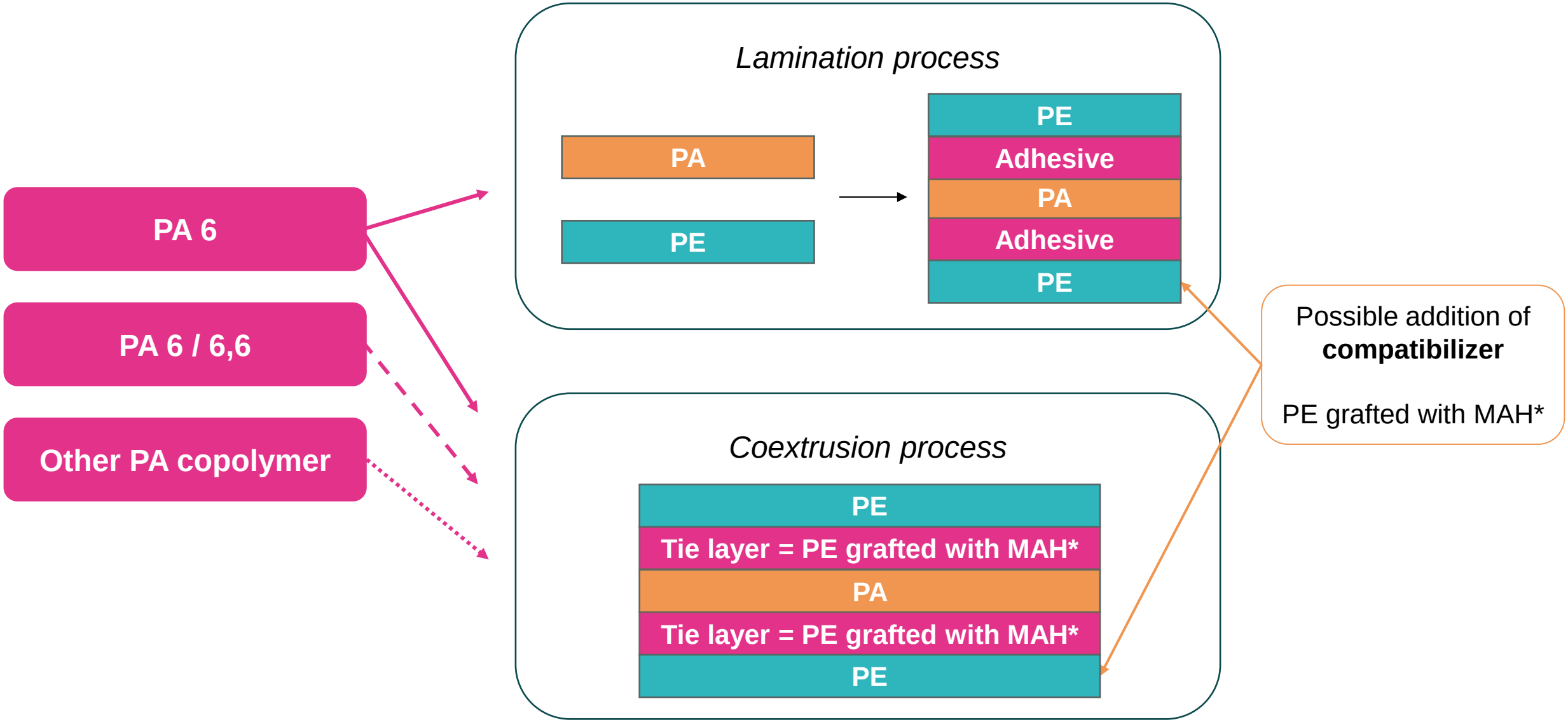


Protection, conservation
of the product

Easier **shaping**,
puncture resistance



What is a PE/PA structure?



*MAH = anhydride maléique

What is the impact of these PE/PA structures in France?

PE/**PA** structures

Regeneration streams in France

Mechanical recycling of **flexible PE packaging**

COTREP Test in 2021

- 1 **laminated PA 6** structure **without compatibilizer**
- 1 **co-extruded PA 6** structure **with 0.2 g PE grafted with < 0.2% MAH/g PA**

REGENERATION AND TRANSFORMATION STEPS	IMPACT
Shredding	No impact
Washing and spinning	No impact
Flotation and drying	The presence of PA makes it more difficult to dry before extrusion.
Extrusion/Granulation	No impact
Blow extrusion	Unstable blow extrusion, presence of porosities invisible to the naked eye at 1% PA.

→ **NON-COMPATIBILITY**
of PE/PA structures in the mechanical regeneration of PE films

02

COTREP Testing Methodology

PE/PA Structures
COTREP Methodology

Comparison

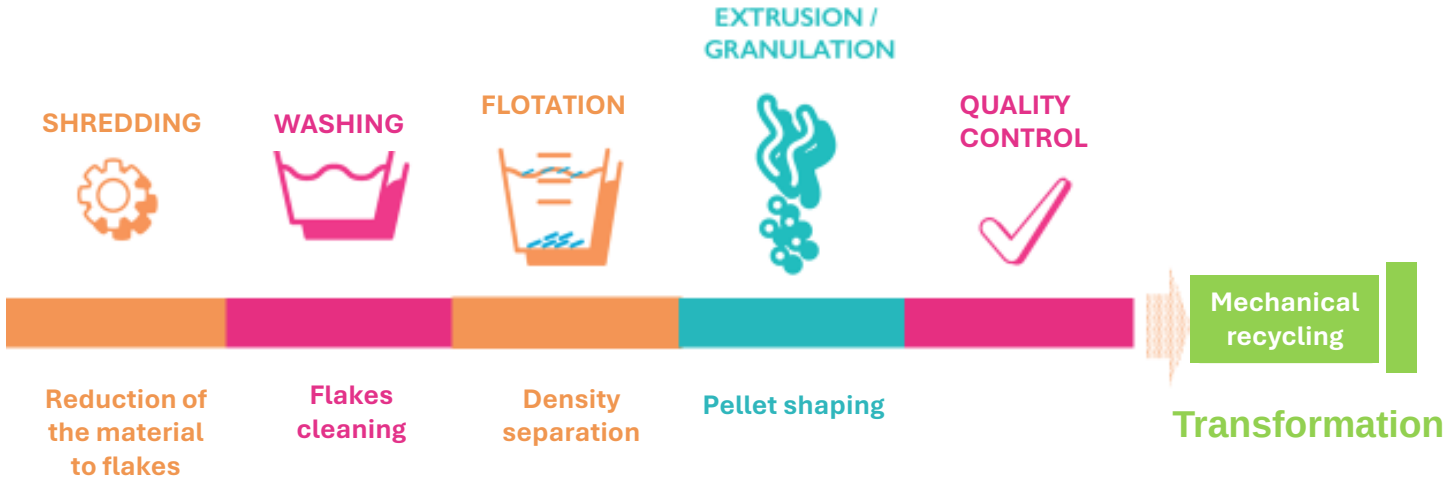
Reference sample

100% recycled pellet

50% Recycled Film

Samples to test

Incorporation of the PE/PA structures



Testing 3 **PA** penetration rates

1% **PA** → ideal and efficient separation by optical sorting
4% **PA** → market rate
7% **PA** → peak concentration

PE/PA Structures
Selection of COTREP samples

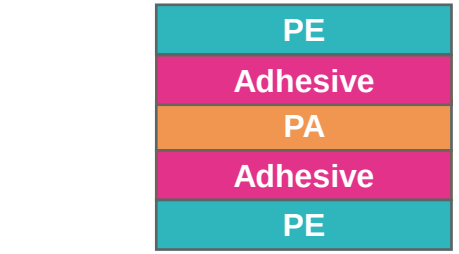
Type of PA	Manufacturing process	Tie layer	PE-type compatibilizer with MAH
PA 6	Lamination	/	0.15 g PE grafted with > 1% MAH/g PA
PA 6	Coextrusion	0.5 g PE grafted with < 0.2% MAH/g PA	/
PA 6	Coextrusion	0.5 g of grafted PE with between 0.1% and 0.5% MAH/g of PA	0.15 g of grafted PE with > 0.7% MAH/g of PA
PA 6	Coextrusion	0.9 g of grafted PE with between 0.2% and 0.5% MAH/g of PA	/
PA 6 / 6,6	Coextrusion	0.5 g of grafted PE with between 0.07% and 0.5% MAH/g of PA	/
PA 6 / 6,6	Coextrusion	0.5 g of grafted PE with between 0.07% and 0.5% MAH/g of PA	0.15 g of grafted PE with > 0.3% MAH/g of PA
PA 6 / 6,6	Coextrusion	0.7 g of grafted PE with ≥ 0.1% MAH/g of PA	/

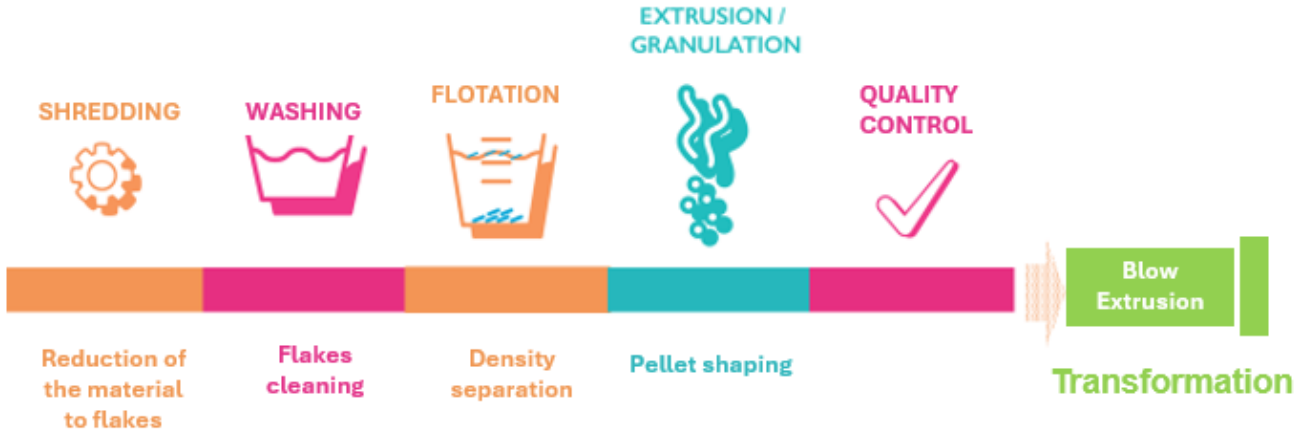
PE/PA Structures
COTREP Results

REGENERATION AND TRANSFORMATION STEPS	IMPACT
Shredding	No impact ✓
Washing and spinning	It should be noted that all the samples tested show a higher humidity level than the reference ✓
Flotation and drying	It should be noted that the presence of PA makes it more difficult to dry before extrusion ✓

PE/PA Structures
COTREP Results

PE/PA 6 STRUCTURES MANUFACTURED BY LAMINATION



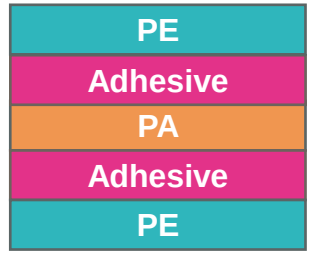


Manufacturing process	PE-type compatibilizer with MAH	Impact extrusion granulation	Impact blow extrusion
Lamination*	/*	No impact on the extrusion process or on the properties of the pellets. ✓	Non-stable extrusion-inflation from 1% PA. No impact on the properties of the films produced. ⚠
Lamination	0,15 g de PE greffé avec > 1 % de MAH / g de PA	At 7% PA, the properties of the pellets are slightly modified, especially the MFI. ⚠	The extrusion inflation is stable up to 7% PA. No impact on the properties of the films produced. ✓

*Structure tested in 2021

PE/PA Structures
COTREP Results

PE/PA 6 STRUCTURES MANUFACTURED BY LAMINATION



Type of PA	Manufacturing process	Tie layer	PE-type compatibilizer with MAH
PA 6*	Lamination*	/*	/*
PA 6	Lamination	/	0.15 g PE grafted with > 1% MAH/g PA

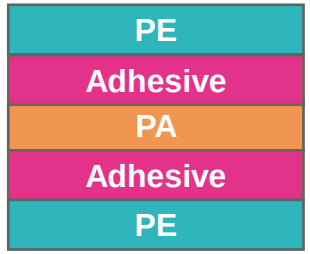
*Structure testée en 2021

The addition of compatibilizer in the PE/PA 6 structure tested and manufactured by lamination

- allows to have a **stability of the blow extrusion process** without impacting the properties of the films produced
- makes **slight changes** to the **properties of the pellets**.

PE/PA Structures
Conclusion

PE/PA 6 STRUCTURES MANUFACTURED BY LAMINATION



PE/PA structure produced by lamination with

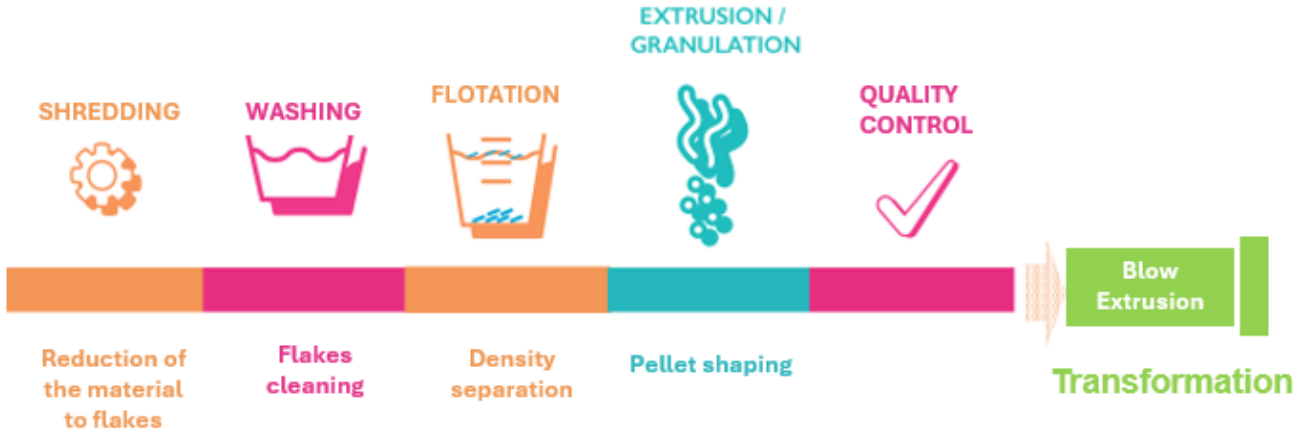
≤ 25 % of PA 6
and **≥ 0.15 g PE compatibilizer grafted with ≥ 1% MAH/g PA**

→ **LIMITED COMPATIBILITY**
in the mechanical regeneration of household flexible PE packaging

PE/PA Structures
COTREP Results

PE/PA 6 STRUCTURES MANUFACTURED BY COEXTRUSION

PE
Tie layer = PE grafted with MAH*
PA
Tie layer = PE grafted with MAH*
PE



Tie layer	PE-type compatibilizer with MAH
0.2 g grafted PE with < 0.2% MAH/g PA*	/*
0.5 g grafted PE with between 0.1% and 0.5% MAH/g PA	/
0.5 g grafted PE with between 0.1% and 0.5% MAH/g PA	0.15 g of grafted PE with > 0.7% MAH/g of PA
0.9 g of grafted PE with between 0.2% and 0.5% MAH/g of PA	/

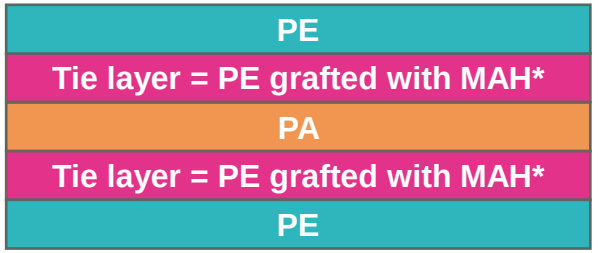
Impact extrusion granulation
No impact ✓
At 7% PA, The properties of the pellets are impacted. > Impact on MFI ⚠
At 4% PA, there is no impact on the extrusion process or on the properties of the pellets ✓

Impact blow extrusion
From 1% PA, blow extrusion is not stable. ⚠
Blow extrusion is stable up to 7% PA. No impact on the properties of the films produced. ✓
Blow extrusion is stable up to 4% PA. Some properties of the films produced are slightly impacted. ⚠

*Structure tested in 2021

PE/PA Structures
COTREP Results

PE/PA 6 STRUCTURES MANUFACTURED BY COEXTRUSION



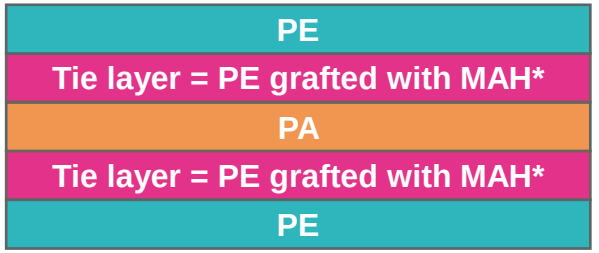
Type de PA	Manufacturing process	Tie layer	PE-type compatibilizer with MAH
PA 6*	Coextrusion*	0.2 g PE grafted with < 0.2% MAH/g PA*	/*
PA 6	Coextrusion	0.5 g of grafted PE with between 0.1% and 0.5% MAH/g of PA	/
PA 6	Coextrusion	0.5 g of grafted PE with between 0.1% and 0.5% MAH/g of PA	0.15 g of grafted PE with > 0.7% MAH/g of PA
PA 6	Coextrusion	0.9 g of grafted PE with between 0.2% and 0.5% MAH/g of PA	/

*Structure testée en 2021

The addition of compatibilizer in PE/PA 6 structures manufactured by coextrusion **does not improve the results obtained.**

PE/PA structures
Conclusion

PE/PA 6 STRUCTURES MANUFACTURED BY COEXTRUSION



PE/PA structure produced by coextrusion with

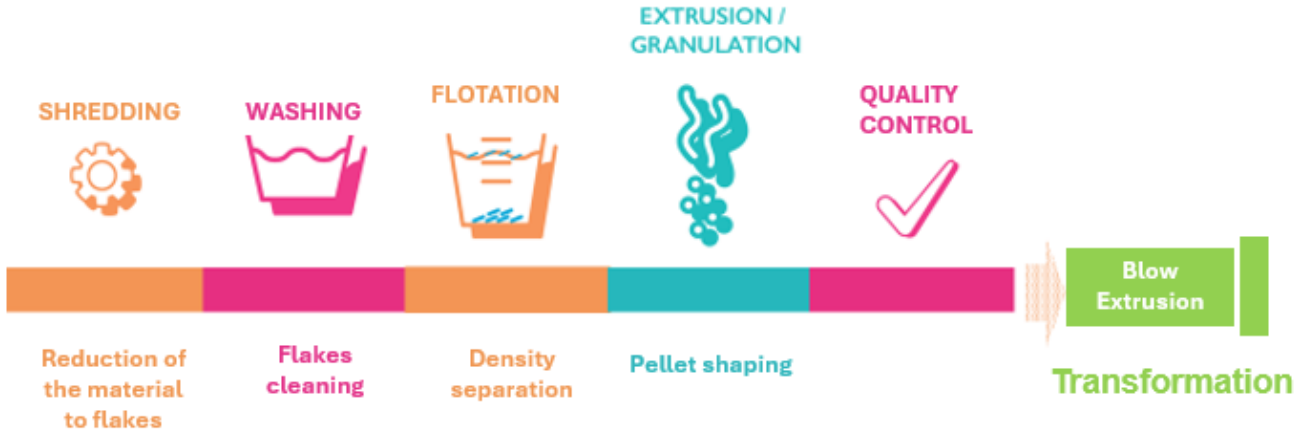
≤ 15 % of PA 6
and **≥ 0.9 g grafted PE tie layer with between 0.2% and 0.5% MAH/g PA**

→ **LIMITED COMPATIBILITY**
in the mechanical regeneration of household flexible PE packaging

PE/PA Structures
COTREP Results

PE/PA 6/6.6 STRUCTURES MANUFACTURED BY COEXTRUSION

PE
Tie layer = PE grafted with MAH*
PA
Tie layer = PE grafted with MAH*
PE



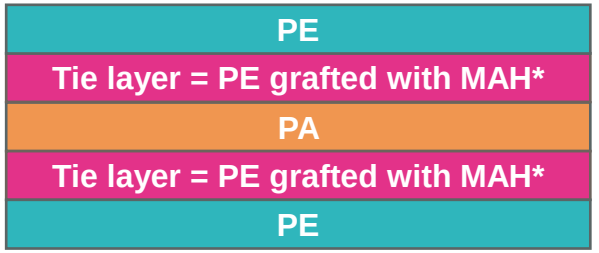
Tie layer	PE-type compatibilizer with MAH
0.5 g grafted PE with between 0.07% and 0.5% MAH/g PA	/
0.5 g grafted PE with between 0.07% and 0.5% MAH/g PA	0.15 g grafted PE with > 0.3% MAH/g PA
0.7 g grafted PE with ≤ 0.1% MAH/g PA	/

Impact extrusion granulation
From 1% to 7% PA, the properties of the pellets are impacted. > Impact on MFI ⚠
No impact on the extrusion process or on the properties of the pellets up to 4% PA. ✓

Impact blow extrusion
Blow extrusion is stable. At 7% PA, the properties of the films produced are impacted, in particular the elongation on traction. ⚠
Blow extrusion is stable. Up to 4% PA, the properties of the films produced are compliant. ✓

PE/PA Structures
COTREP Results

PE/PA 6/6.6 STRUCTURES MANUFACTURED BY COEXTRUSION

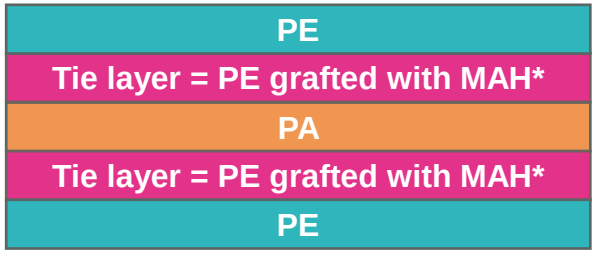


Type de PA	Manufacturing process	Tie layer	Tie layer	PE-type compatibilizer with MAH
PA 6 / 6,6	Coextrusion	0.5 g of grafted PE with between 0.07% and 0.5% MAH/g of PA	/	
PA 6 / 6,6	Coextrusion	0.5 g of grafted PE with between 0.07% and 0.5% MAH/g of PA	0.15 g of grafted PE with > 0.3% MAH/g of PA	
PA 6 / 6,6	Coextrusion	0.7 g of grafted PE with ≥ 0.1% MAH/g of PA	/	

The addition of compatibilizer in PE/PA 6/6.6 structures manufactured by coextrusion **does not improve the results obtained.**

PE/PA Structures
Conclusion

PE/PA 6/6.6 STRUCTURES MANUFACTURED BY COEXTRUSION



PE/PA structure produced by coextrusion with

≤ 15 % of PA 6/6,6 with a melting temperature **≤ 192 °C**
and **≥ 0.7 g of PE tie layer grafted with ≥ 0.1% MAH/g PA**

→ **LIMITED COMPATIBILITY**
in the mechanical regeneration of household flexible PE packaging

03

New COTREP recommendations

New COTREP guidelines

PE/PA structure produced by lamination with
≤ 25 % of PA 6
and **≥ 0.15 g PE compatibilizer grafted with ≥ 1% MAH/g PA**

PE/PA structure produced by coextrusion with
≤ 15 % of PA 6
and **≥ 0.9 g of grafted PE tie layer with between 0.2% and 0.5% MAH/g PA**

PE/PA structure produced by coextrusion with
≤ 15 % of PA 6/6,6 with a **melting temperature ≤ 192 °C**
and **≥ 0.7 g of PE tie layer grafted with ≥ 0.1% MAH/g PA**

→ **LIMITED COMPATIBILITY**
in the mechanical regeneration of household flexible PE packaging

Other PE/PA structures

→ **NON-COMPATIBILITY**
in the mechanical regeneration of household flexible PE packaging

AG70 FR : https://www.cotrep.fr/content/uploads/2021/12/cotrep-ag70-pe-pa-2026.pdf
AG70 EN : https://www.cotrep.fr/content/uploads/2022/01/cotrep-ag70-pe-pa-2026-en.pdf

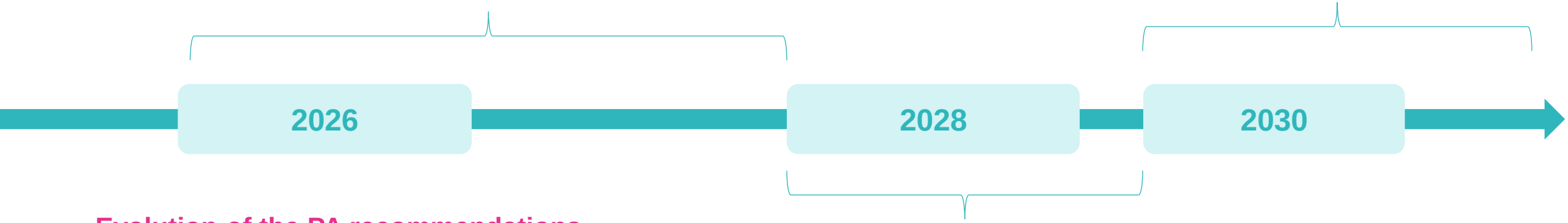
2026, and after?

COTREP remains the r**eference in French law for CITEO's clients.**

At the same time, COTREP **feeds Europe** with its knowledge through its members.

PPWR and standards become the benchmark.

COTREP continues to feed Europe with its knowledge through its members.



Evolution of the PA recommendations compared to the 2021 position

European recommendations and COTREPs ones **coexist.**

COTREP is supporting the transition.

Any questions ?

A team at your disposal















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Give us your opinion

Please take a few minutes to complete our satisfaction survey.

This allows us to always better meet your expectations. Your feedback is precious.

Thank you!

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