meetingPACK 2017

3rd EDITION

Film multicapa biodegradable con propiedades barrera adecuadas para el envasado de alimentos

Biodegradable multilayer film with barrier properties suitable for food Packaging

Salvador Martinez de Maya
(PLÁSTICOS ROMERO)

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Integral solutions in packaging

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Founded in 1979

75 M€ Turnover 2016 (20M€ export)

36.000 Tn Plastics

5.000 Tn Papier

300 employees

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PRODUCTION PLANT IN MOLINA DE SEGURA 32,000 M²

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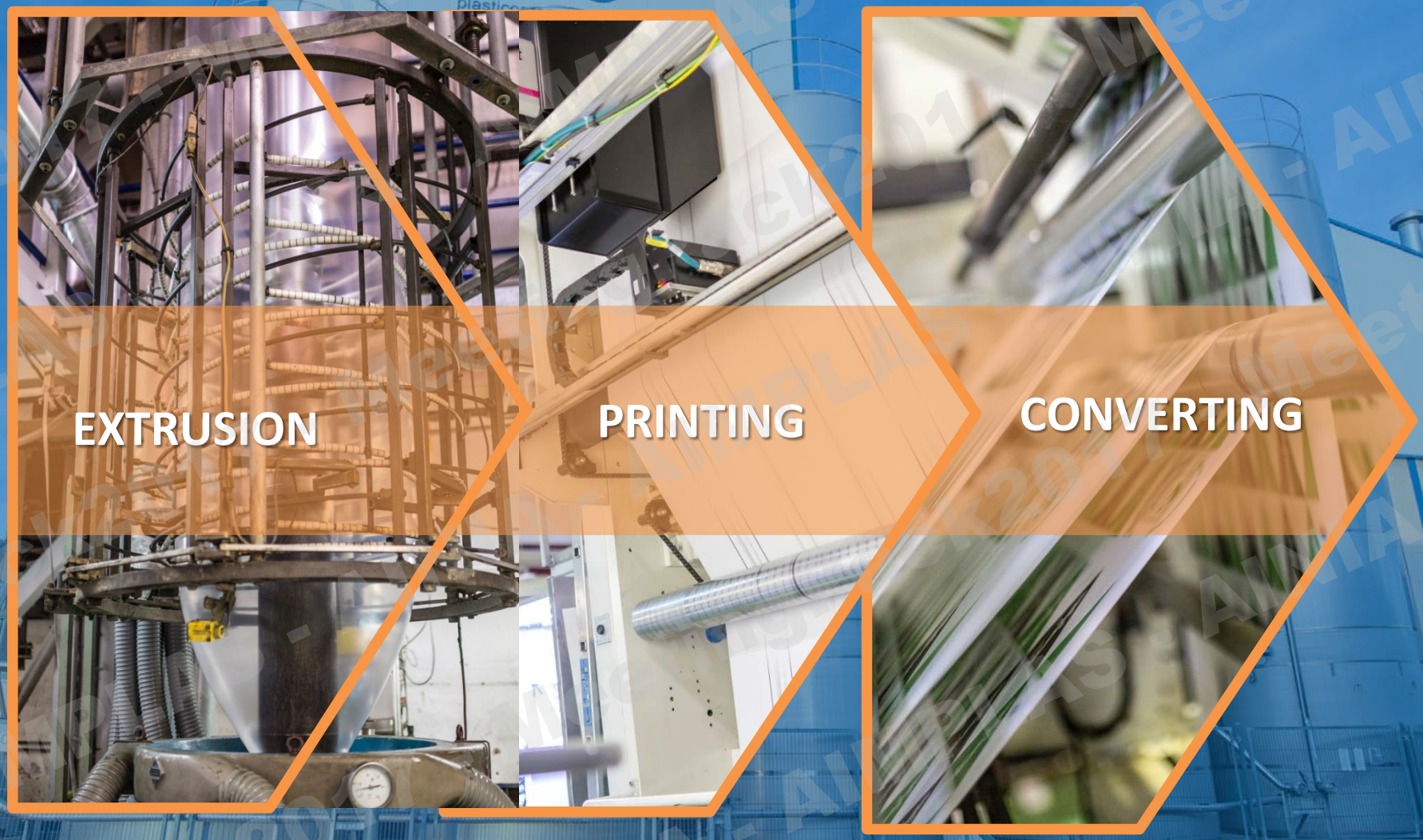

Principal research lines……

IMPROVEMENT IN PRODUCTIVITY

- Innovation in new materials
- Innovation as a way to improve processes

NEW PRODUTCS

- Ergonomics, adaptability and improvement of the use.
- Improvement of the food conservation.
- Active and smart packaging.

SUSTAINABILITY

- Recovery of waste plastics
- Manufacture of bio-products.
- Optimization of recycled packaging.

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BIO ROMERO®

Biodegradable Packaging

Re-used Packaging

Recycled Packaging

Eco-Packaging

OK compost VINÇOTTE

HOME OK compost VINÇOTTE

DER BLAUE ENGEL JURY UMWELTZEICHEN MENSCH UND UMWELT

FSC

PEFC

h2Oink® TINTAS AL AGUA

BOLSA REUTILIZABLE según UNE 53942

AENOR Producto Certificado 001/705

AENOR Medio Ambiente Bolsas

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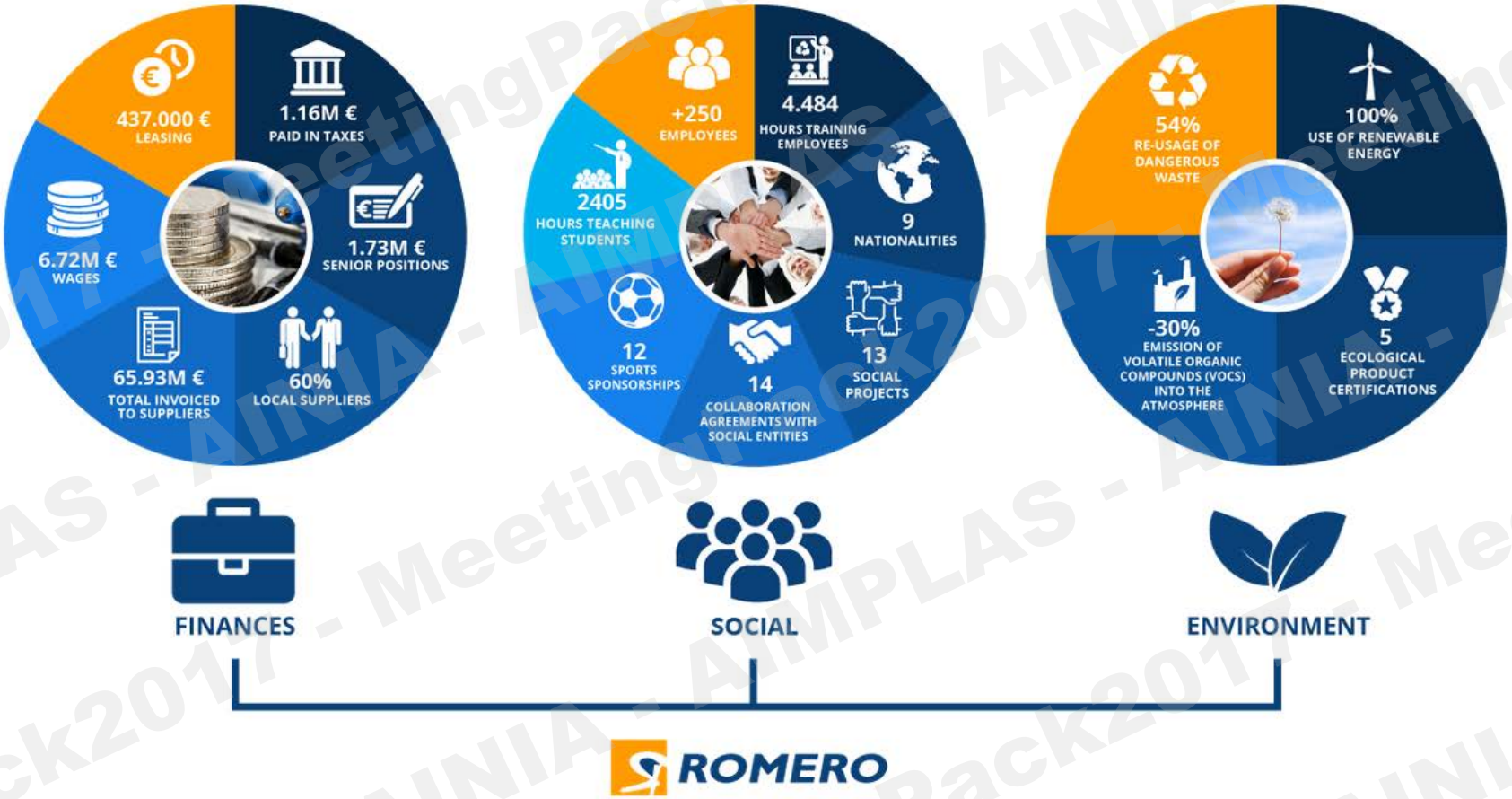

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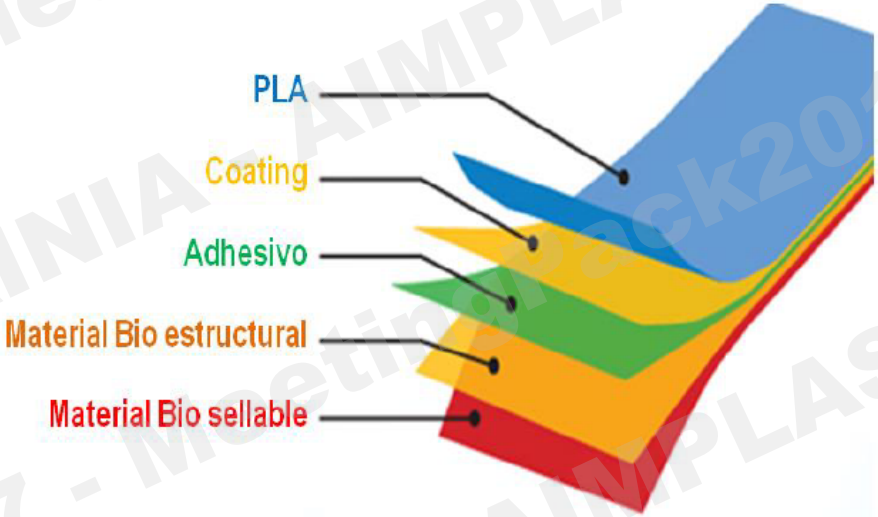
RECUBIO PROJECT: Development of flexibles films and biodegradable multilayers to be used as middle barrier food packaging.



- 1.-Bakery or snacks products
- 2.-Fresh food products
- 3.-Frozen food

The lost of properties of plastics

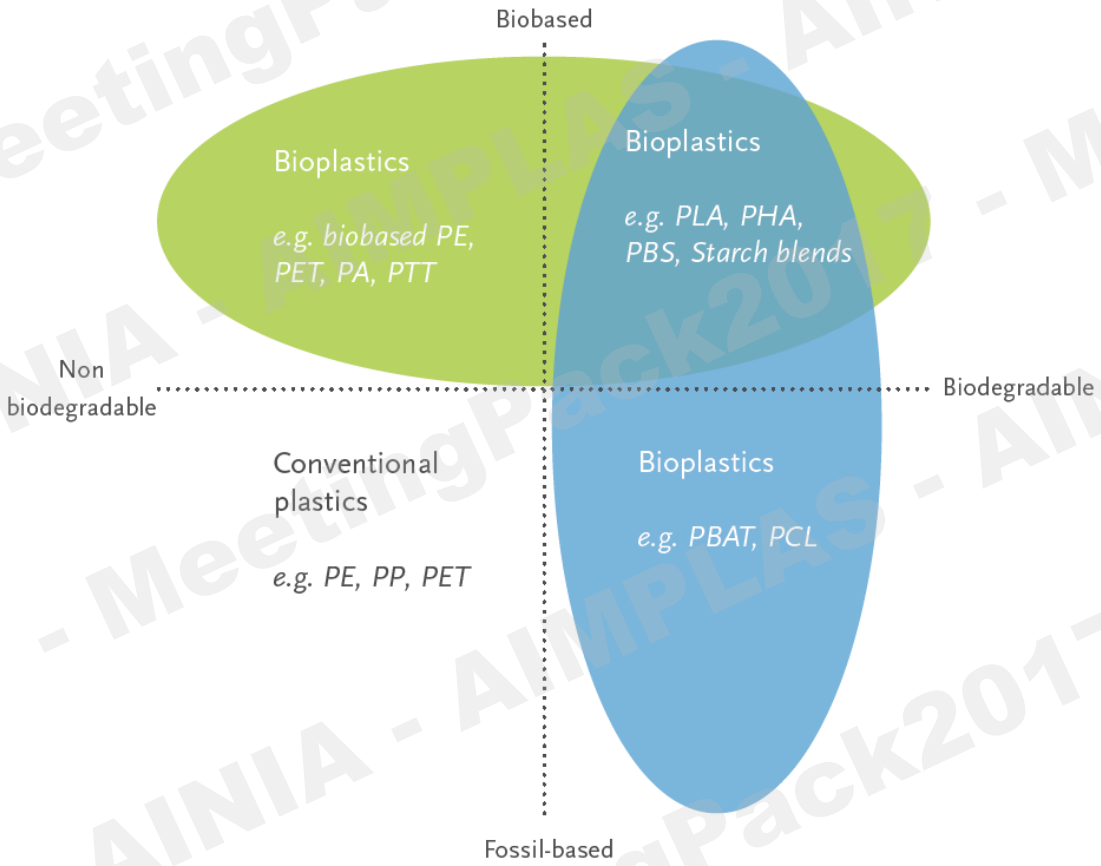


Figure: Bioplastics' material coordinate system, 2015.

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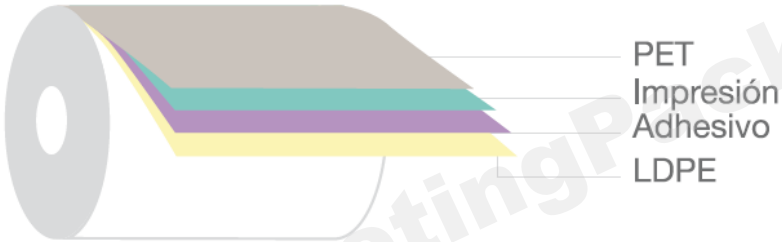

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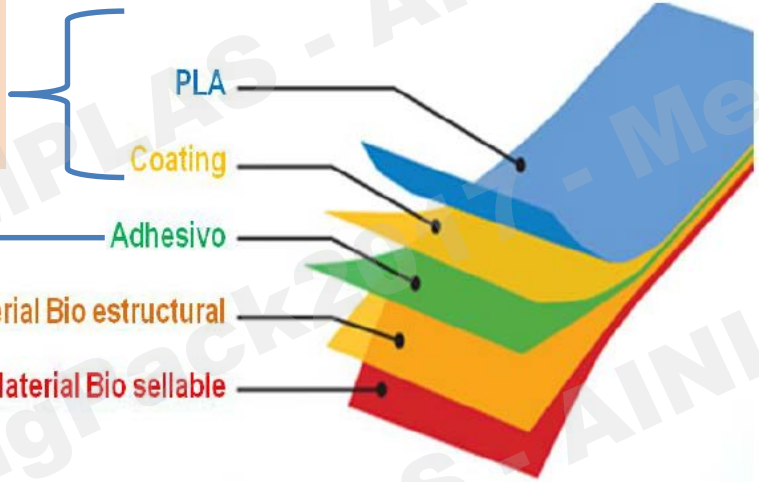
Structure 2: Coating and Lamination
- Challenge 3: Barrier properties
- Challenge 4: Printability

Challenge 5: Biodegradable

Structure 1: Co-extrusion
- Challenge 1: Mechanical Properties
- Challenge 2: Sealing Properties



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- Challenge 1: MECHANICAL PROPERTIES

	F. Brake MD (Mpa)	Elongation MD (%)	F. Brake TD (Mpa)	Elongation TD (%)	Tear Resistence MD (mN)	Tear Resistence TD (mN)
Sample Objetive 1 Mechanical requirements.	130	200	200	60	150	130
Sample Objetive 2 Mechanical requirements.	50	[illegible]	[illegible]	550	600	4200
Sample Objetive 3 Mechanical requirements.	25	[illegible]	[illegible]	30	200	400

		Imp. Dardo (g)	F. Brake MD (MPa)	Elongation MD (%)	F. Brake TD (MPa)	Elongation TD (%)	Tear Resistence MD (mN)	Tear Resistence TD (mN)
1		162,5	31,01	303,63	23,71	319,1	449	1150,2
2		>200	25,61	310,18	18,93	368,43	5386,8	2946,8

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Challenge 2: Sealling Properties

	Temperature (ºC)	Time (s)	Pression (bar)	Resistence (N)	
				Medium value	Standard Deviation
Sample Objetive 1 Mechanical requirements.	130	0,9	3	5,81	0,74
Sample Objetive 2 Mechanical requirements.	120	1	3	21,82	0,46
Sample Objetive 3 Mechanical requirements.	130			31,8	1,31

Sam		Resistencia máx (N)
1		9,19
2	15	11,59
3	15	12,68
4	15	11,72
5	15	9,05
6	15	13,24
7	15	11,48
	Medium Value	11,28
	Standar Desviation	1,606

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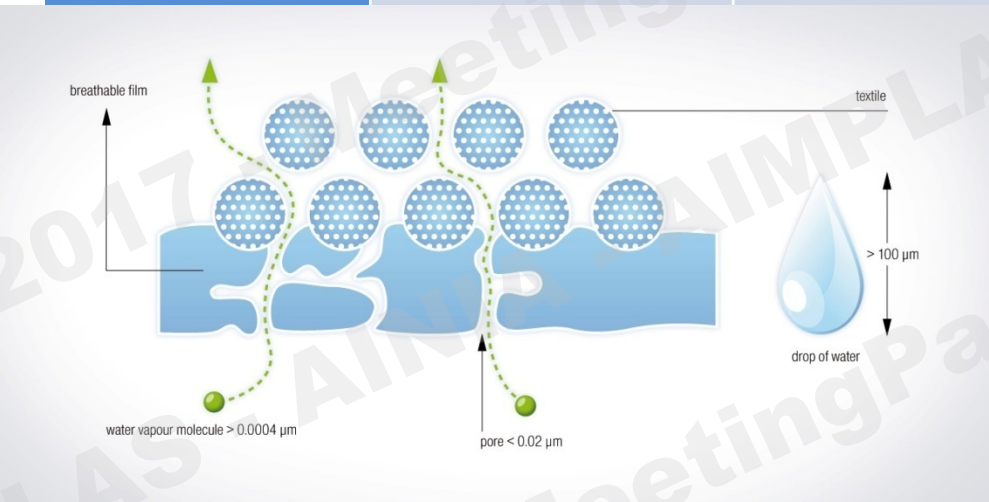
- Challenge 3: Barrier Properties

	Permeability O_2 (cc*mm/m2x24hxbar. 23ºC;0%H.R.)	Permeability WV (g*mm/m2x24hxbar. 38ºC, 90%H.R.)
Sample Objetive 2	5,71	0,65
Barrier Properties		



Description	Permeability O_2 (cc*mm/m2x24hxbar. 23ºC;0%H.R.)
	AVERAGE
PLA without Coating	17,16
PLA Coating 1	3,84
PLA Coating 2	0,04
Description	Permeability WV (g*mm/m2x24hxbar. 38ºC, 90%H.R.)
	AVERAGE
PLA without Coating	6,55
PLA Coating 1	3,32
PLA Coating 2	2,37

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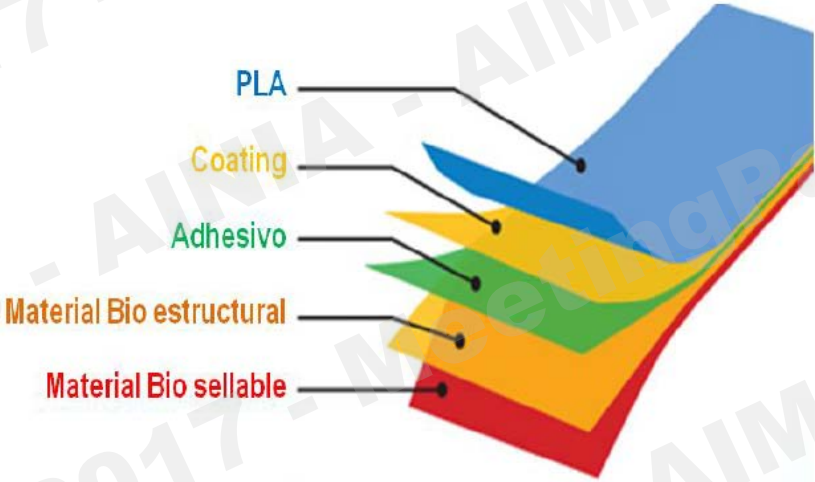
- Challenge 3: Barrier Properties

	Permeability O_2 (cc*mm/m2x24hxbar. 23ºC;0%H.R.)	Permeability WV (g*mm/m2x24hxbar. 38ºC, 90%H.R.)
Sample Objetive 2 PA conventional	5,71	0,65
Barrier Properties		



Description	Permeability O_2 (cc*mm/m2x24hxbar. 23ºC;0%H.R.)
	AVERAGE
PLA without Coating	17,16
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Description	Permeability WV (g*mm/m2x24hxbar. 38ºC, 90%H.R.)
	AVERAGE
PLA without Coating	6,55
PLA Coating 2	2,37

Description*	Permeability O_2 (cc*mm/m2x24hxbar. 23ºC;0%H.R.)
	AVERAGE
PREUBA 2: PLA + Adhesivo + Coex Bio	0,10
	Permeability WV (g*mm/m2x24hxbar. 38ºC, 90%H.R.)
PRUEBA 2: PLA + Adhesivo + Coex Bio	7,26

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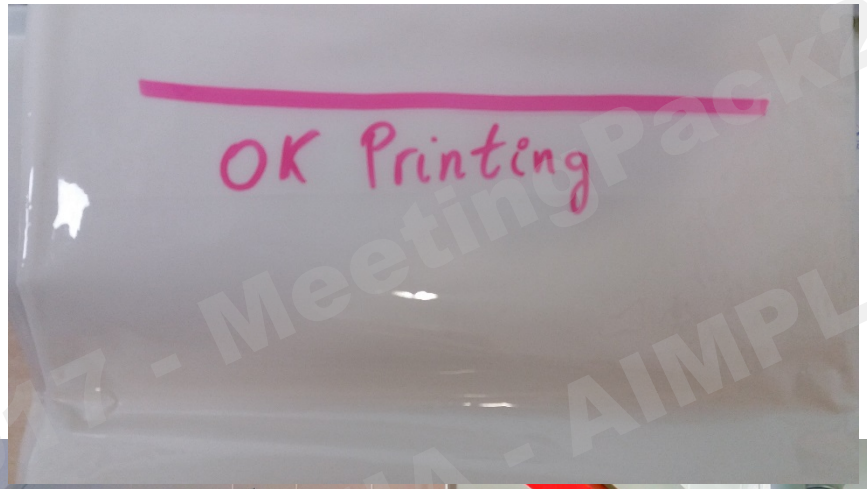
- Challenge 4: Printability



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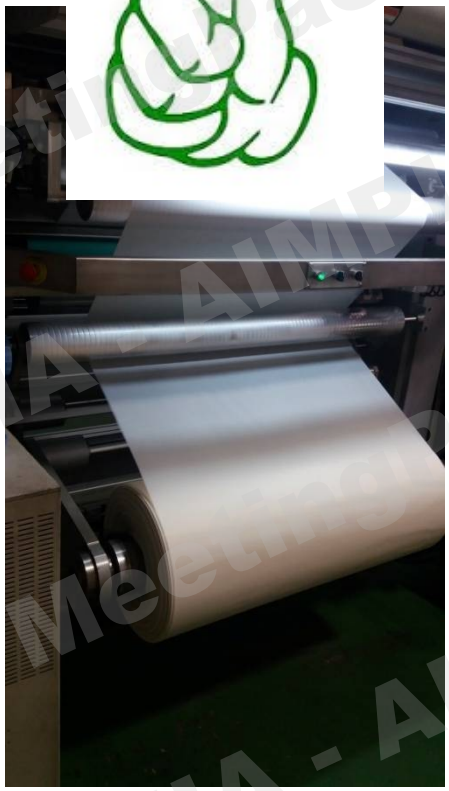
- Challenge 5: Biodegradability



	Adhesive (g/cm^2)	% Weight
SAMPLE 1	1,4	0,99%
SAMPLE 2	1,2	0,85%

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Challenge 5: Biodegradability

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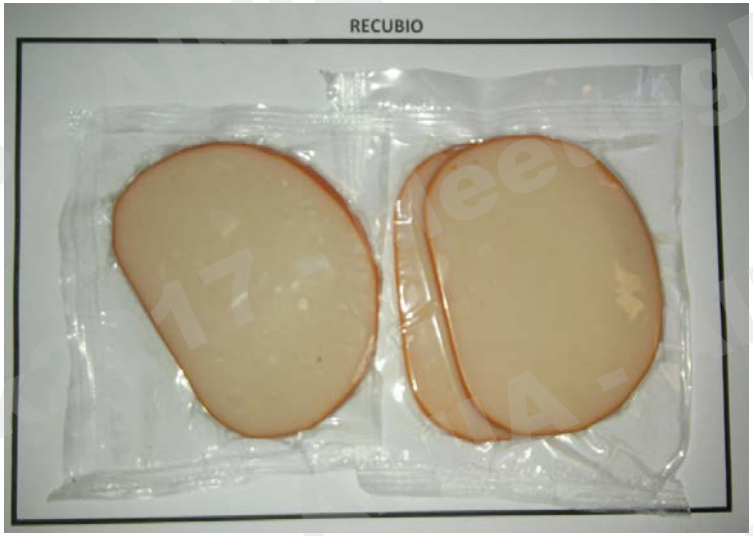
FINISH PRODUCT



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Conclusions

Structure 2: Coating and Lamination
- Challenge 3: Barrier properties
- Challenge 4: Printability

Challenge 5: Biodegradable

Structure 1: Coextrusion
- Challenge 1: Mechanical properties
- Challenge 2: Sealing Properties

Next Challenge: Transparency

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" The Best way to predict the future is to influence it"
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