LIFE 2018 Conference in Zagreb

2nd of February 2018

PLA4COFFEE

Project co-funded by the European Commission within the LIFE + Programme (2014–2020)
Grant agreement no.: LIFE-PLA4COFFEE ENV/IT/000744

Project Coordinator: Mr. Cesare Rapparini

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SCOPE

Aim of the Project

The project demonstrated potentials of new PLA based formulations to be scaled for the production environmental friendly of coffee capsules and many other consumer goods.

Convincing coffee capsules producers that the use of new bio-based materials can meet the specifications required by the reference market.

Demonstrating how an industrial innovation can ensure new productions with reduced environmental impact while safeguarding economic growth.

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PARTNERS

PROGECT LOCATION: **Rome, Bologna, Vicenza, Naples**

BUDGET INFO:

- **Total Amount: 2.831.217EUR**
- **% EU Co-Funding: 60 %**

Scheduled Duration

Beginning: 16/07/2015 - End: 15/01/2018

PROJECT'S IMPLEMENTORS:

Coordinator Beneficiary: Aroma System

Associated Beneficiaries: Università degli Studi di Roma Tor Vergata,
A.P.I. Applicazioni Plastiche Industriali,
IPCB-CNR Istituro per i Polimeri, Compositi e Biomateriali

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PARTNERS

A.P.I. Applicazioni Plastiche Industriali S.p.A.

API Applications Plastics Industriali is an Italian chemical company that has been operating since 1956 in the field of research, development and production of compound thermoplastic materials.

IPCB-CNR Istituto per i Polimeri, Compositi e Biomateriali

IPCB develops research in the field of Polymeric Materials, Composites and Biomaterials in order to apply the proposed innovations and subsequently industrialize them in companies and districts.

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PARTNERS

Università di Roma Tor Vergata
Enterprise Engineering dpt.

Tor Vergata" stands out in the U-Multirank ranking among the top 50 universities for the teaching quality student learning. It is also ranked at the 81st place in the world by the Times (Times Higher Education), which considers only universities founded less than 50 years ago.

ICA- Aroma Systems S.r.l.

Aroma System s.rl. is part of the ICA group, leader company in manufacturing of packaging machines. Aroma System is responsible for coffee capsules filling machines and testing.

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TIME LINE

	Action leaders	Year 2015						Year 2016												Year 2017												Year 2018		
		M1 (16/07 - 15/08)	M2 (16/08 - 15/09)	M3 (16/09 - 15/10)	M4 (16/10 - 15/11)	M5 (16/11 - 15/12)	M6 (16/12 - 15/01)	M7 (16/01 - 15/02)	M8 (16/021 5/03)	M9 (16/03 - 15/04)	M10 (16/04- 15/05)	M11 (16/05- 15/06)	M12 (16/06 15/07)	M13 (16/07- 15/08)	M14 (16/08 - 15/09)	M15 (16/09 - 15/10)	M16 (16/10 - 15/11)	M17 (16/11 - 15/12)	M18 (16/12 15/01)	M19 (16/01 - 15/02)	M20 (16/02 15/03)	M21 (16/03 - 15/04)	M22 (16/041 5/05)	M23 (16/05- 15/06)	M24 (16/06 - 15/07)	M25 (16/07 - 15/08)	M26 (16/08 - 15/09)	M27 (16/09 - 15/10)	M28 (16/10 - 15/11)	M29 (16/11 - 15/12)	M30 (16/12- 15/01)	M31 (16/01- 15/02)	M32 (16/02- 15/03)	M33 (16/03- 15/04)
A. Preparatory actions																																		
A.1 Design of the pilot capsules according to product requirements	AROMA							M1																										
B. Implementation actions																																		
B.1 Fine tuning of new polylactic acid based formulations for the production of compostable coffee capsules	TOV										M2																							
B.2 Production of the fine tuned formulations at preindustrial scale	API																						M4											
B.3Realisation of the coffee capsules at preindustrial scale using the injection molding technology and performance tests	AROMA																												M6					
B.4 Realisation of the coffee capsules at preindustrial scale using the compression molding technology and performance tests	AROMA																												M5					
B.5 Last optimisation and testing of the whole process	AROMA																													M7				
C. Monitoring of the impact of the project actions																																		
C.1 Environment impact assessment and LCA	AROMA																													M8				
C.2 Socio-economic impact assessment	AROMA																		MTR															FR
D. Communication and dissemination actions																																		
D.1 Dissemination and communication	IPCB-CNR													M3																				
E. Project management and monitoring of the project progress					Kick off meeting																													
E.1 Project Management	AROMA						PM2						PM3						PM4											Final meeting				
E.2 Progress monitoring	AROMA																																	
E.3 Networking with other EU projects	AROMA																																	
E.4 After LIFE+ Communication Plan	AROMA																																	

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The PROBLEM to be solved

COFFEE CAPSULE Environmental Issue

THE COFFEE INDUSTRY
URGENTLY NEEDS MORE SUSTAINABLE PACKAGING OPTIONS

Single serve coffee pods
ARE NOT EASILY RECYCLABLE

MIXED MATERIALS such as exausted coffee powder, plastic, aluminium are, without being separated, **SENT TO LANDFILL.**

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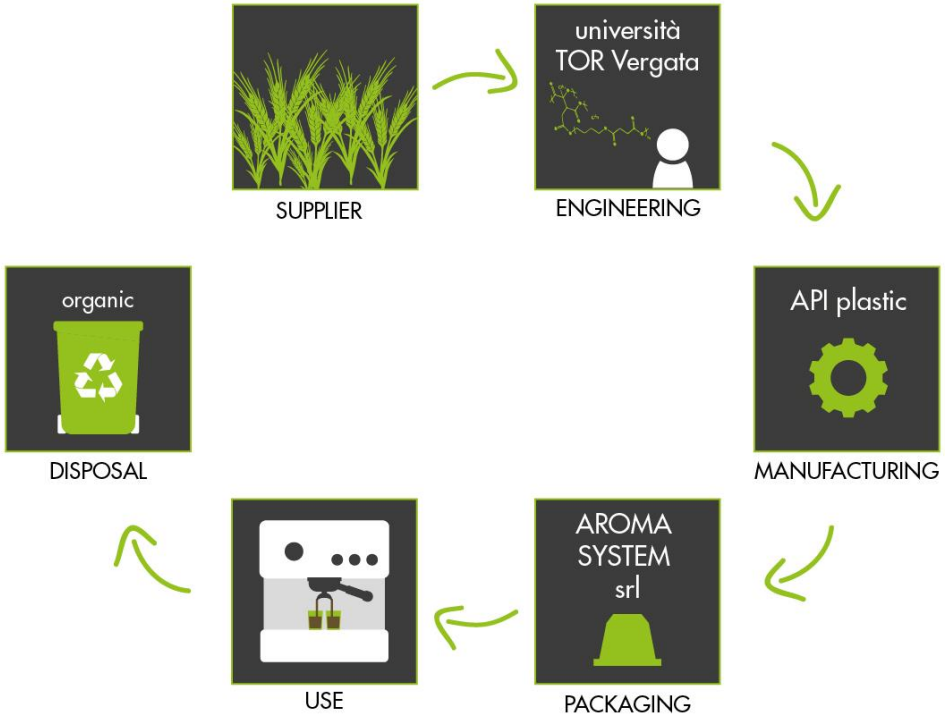
From a linear economy

To a circular economy



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Project requirements/results

1. **Compostable** and **biodegradable** according to US and EU Industrial composability regulations

2. **No recourse to nano-materials** that can be dangerous for health and environment (no working regulations in EU27)

3. **Suitable for food contact** and/or safe for humans and environments

4. **High biobased** content >96%

5. **Easy to process polymer** (extrusion; injection, compression and stretch blow molding; sheet polymer forming; thermoforming; fibers, foams …)

6. **Tough and thermally stable** (150°C!!!!!!!!!!!)

7. Some numbers: Elastic Modulus (> 4.0 GPa); Elongation at break (> 10.0 %); Flexural strength (> 100 MPa); Flexural Modulus (> 5 GPa); Tensile Strength (> 60 MPa)

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Non engineered PLA capsule

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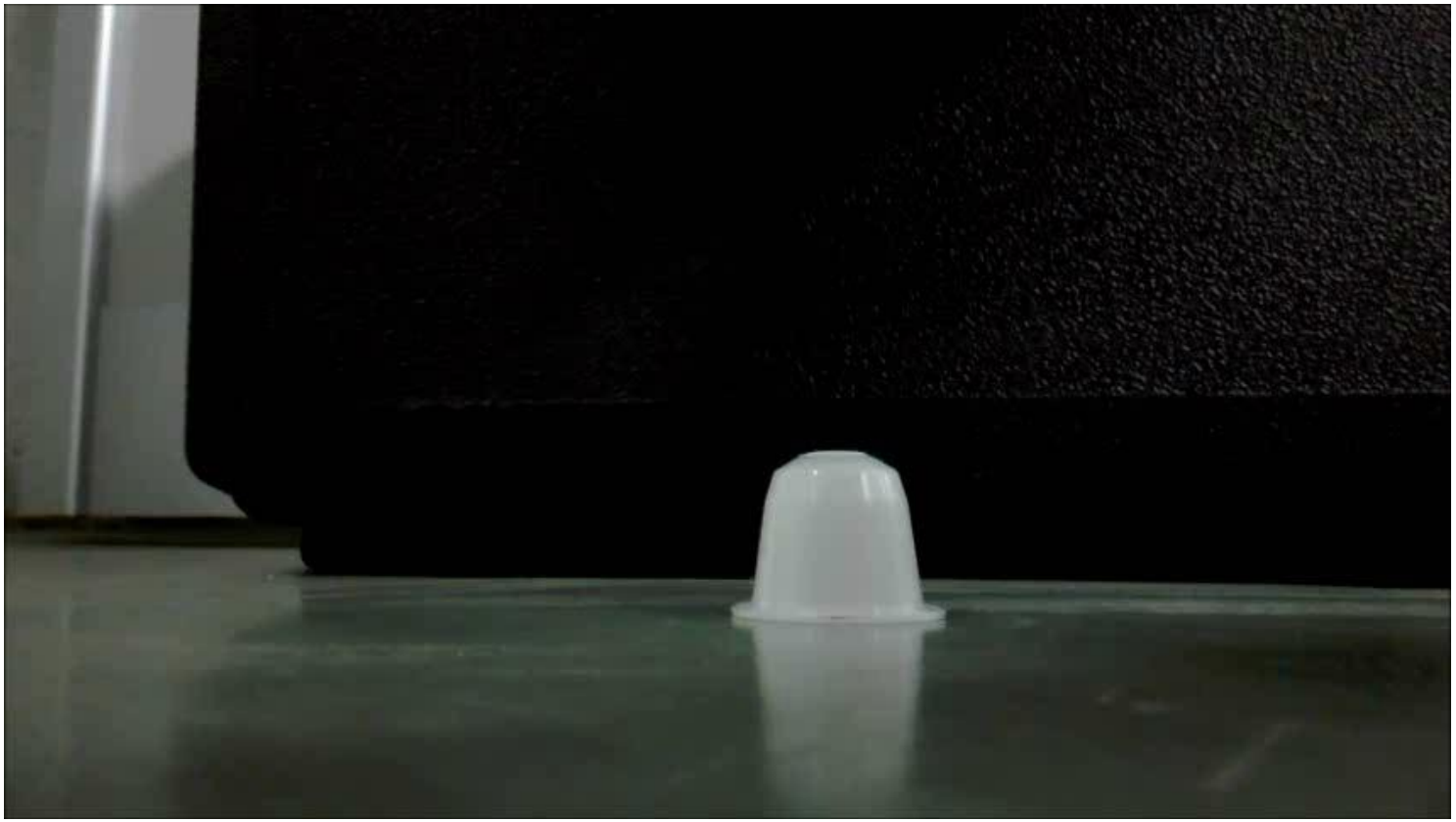
Engineered PLA capsule



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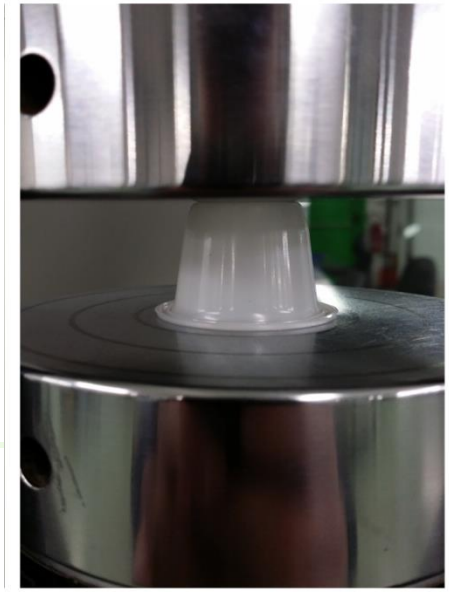
Tests

Compression test

- Test speed 2,5-10-50-100 mm/min



Coffee brewing test

- Automatic and manual coffee machines

Impact test

- Load 0,5 Kg
- Impact high = 0,3-0,6-0,9-1,2 m

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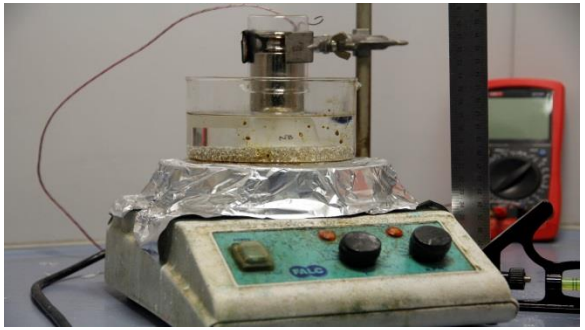
More Tests

Annealing thermal treatment

Thermal stability test

- Temperatures 90-110-130-150 °C
- Load 0,5 Kg



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Contacts:
https://pla4coffee.wordpress.com/