



The partners of the LOOP4PACK project are pleased to announce that the D4.3 deliverable, D4.3 deliverable, “Cartography of characteristics needed for new packagings”, is finished and has been sent to all partners on the 12/06/2020. This deliverable was written by Frédéric Merle (Euramaterials).

### Summary of the deliverable:

The aim of this deliverable is to and collect data about food packaging characteristics that will constitute essential inputs for the production of tailored PHA (PolyHydroxyAlkanoates) based materials within the project. The first focus is made on McCain case-study with frozen fries packaging distributed to consumers through large retail stores. Then a review of alternative but very close applications is made; frozen food packaging, fresh food packaging and trays. Finally, a benchmarking of existing solutions already available on the market, their specification and prices and the gaps yet to be filled to comply with end user needs completes the study.

The review of Mc Cain specific needs packaging (frozen french fries) characteristics highlights the main following specifications:

- 24 months expected shelf life
- -18° storage conditions with possible water and ice contact
- Tear resistance
- Ability to print
- Sealing capacity

For packaging dedicated to frozen vegetables, the required shelf life varies from 8 to 10 months and oxygen barrier properties are required as the food is packaged in a modified atmosphere.

For fresh vegetables, expected shelf life is reduced to 5 to 10 days and storage conditions temperature up to 4°. Adapted oxygen and water barrier is the key point to comply with.

Finally, trays for hot and cold food have an expected shelf life of no more than one week but can be subjected to temperatures up to 120°, can be heat-sealed with peelable film and are preferably microwave compatible.

For each packaging material, a supplier technical specification sheet is provided as example of the materials usually used in trade.

Biodegradable plastics altogether, including PLA, PHA, starch blends and others, account for over 55.5 percent (over 1 million ton) of the 2019 global bioplastics production capacities, packaging remaining the



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first field of application. Despite dynamic researches and developments on biodegradable material, gaps remain to meet the huge market and society demands, mainly :

- Tear resistance at low temperatures
- Hydrophobicity
- Lack of barrier properties (oxygen, water, fat)
- Use of feedstock in competition with human food needs
- Not fully biodegradable in natural conditions

The price of biopolymers and restricted processing conditions are other constraints that prevent their widespread use.

A review of existing products already on the market is then provided, with their main applications, processing methods and characteristics, including Futurama's cellulosic materials, Taghleef's Pla-based packaging, BASF's Ecovio, Novamont's starch-based packaging...

In conclusion, improving compostability clearly appears to be a common need for new food packaging, even if it should not call into question the properties related to food protection and processing. The project may reveal technical limitations and the impossibility of achieving all the targeted properties; it will then be necessary to study the extent to which some of the targeted technical constraints can be alleviated.

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