

## Supercritical CO<sub>2</sub> process for the delamination of complex multimaterials wastes to enable their recycling and reuse

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Food packaging's, clothes & shoes, solar panels, credit cards, skis... These are complex and technical objects composed of multiple layers of different materials. They are usually bound together to bring several required properties to the product (mechanical strength, oxygen barrier, hydrophobicity...). Taken separately, each material can often be well recycled or reused. But the separation process can be costly or sometimes impossible, especially when shredding processes are involved. Thus, these objects containing valuable and non biodegradable materials are usually incinerated or buried in landfills.

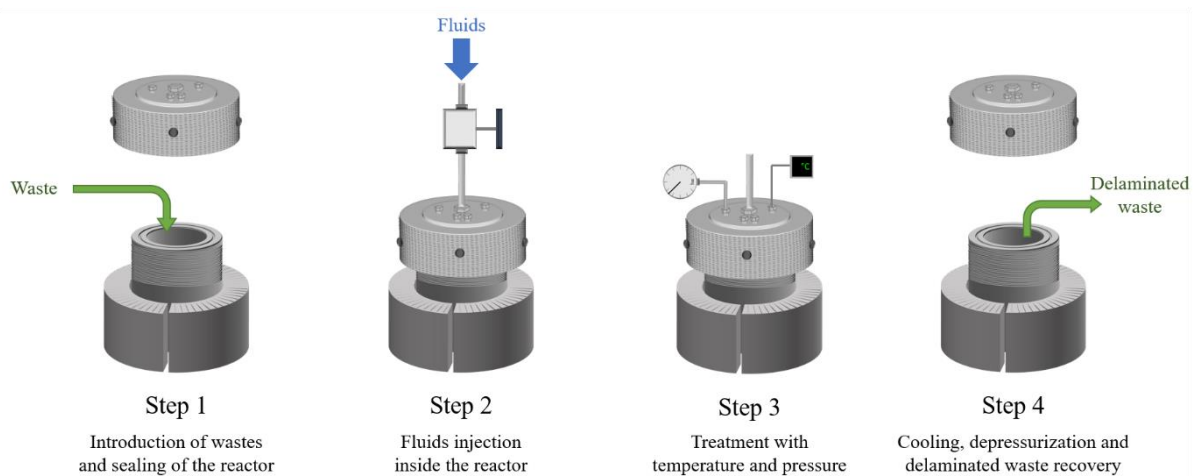


Figure 1 : Simplified scheme of the IDELAM process using supercritical CO<sub>2</sub> and co-solvents.

The IDELAM company develops a fast and clean process, using supercritical CO<sub>2</sub> and co-solvents, to delaminate materials from complex wastes, to enable their recycling and/or reuse. Feasibility and proof of concept have been validated on batch reactors at lab scale on dozens of different products. The process exhibits a great sturdiness and has proven to be efficient on native and used/spoiled wastes. With relatively low operating temperatures and pressures (compared to conventional supercritical processes) of about 100 °C and 100 bar, the IDELAM process focuses on glues and interfaces bonding. Therefore, bulk materials have very little degradation and can be sorted after delamination in order to recycle or reuse them. The oral presentation will present some of IDELAM development in terms of waste delamination and prospects for on-going projects.

