

# Functional separators for batteries

Energy, Battery, Separator, Polymer Membrane



## REFERENCE

BATTERY [D02346]

## KEYWORDS

SEPARATOR / BATTERY / LITHIUM-ION



## APPLICATIONS

- Separator manufacturing
- Battery integration



## TARGET MARKETS

- Energy
- Membranes / separator producers
- Battery manufacturers

## Technology readiness level

TRL 3-4 → TRL 4-5 in 2021



## INTELLECTUAL PROPERTY

Patent application filed (2020)



## RESEARCH TEAMS

Ingénierie des Matériaux Polymères (IMP) and Laboratoire Electrochimie et Physicochimie des Matériaux et des Interfaces (LEPMI)

UCBL, CNRS, INSA Lyon, UGA, INP Grenoble, USMB, University of Lyon

## DESCRIPTION

Batteries electricity storage is a rapidly expanding industrial sector, thanks to the bloom of portable electronic, electrified transport, and stationary storage. Lithium-ion technology has allowed considerable progress in performance, but challenges still need to be addressed to improve energy density, power and life cycle in batteries.

The technology proposed herein is focused on the battery separators. With a simple modification of commercial separators, lifetime and performances of batteries integrating those new membrane separators are greatly improved.

## COMPETITIVE ADVANTAGES

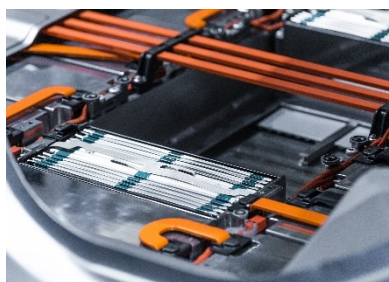
- Performance improvement compared to commercial separator:
  - Higher ionic conductivity and transport number
  - Lifetime : increased cycling
  - Enhanced power
  - Better wettability : prevents vacuum filling
- Manufacturing compatible with existing processes
- Relevant for any battery technology using porous separators

## DEVELOPMENT

- Effective ionic conductivity of modified separator in LP30 medium = 1 mS/cm à 25°C
- No short-circuit after 1000 h cycling in Li-Li cell
- Discharge capacity maintained in Li-NMC cell after 100 cycles
- Power x 6-7 vs a commercial separator at 3C in Li-NMC
- Enhanced safety

## PARTNERSHIP

PULSALYS is looking for industrial partners for the commercialization or co-development of the technology (licensing).



## CONTACT

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