

PREPARING A PROPOSAL FOR

Eureka Network Lightweighting Technologies 2026

Lightweighting&Enhancing Performance of Polypropylene Compound via ZIF-8/MPF Masterbatch Development

(LIGHT&GREEN MOF MASTERBATCH)

A Türkiye-based consortium composed of a compounding company and a research institute, seeking further partners.

Serkan Kurt

Tisan Engineering Plastics Co., Türkiye

- Masterbatch & Compound Production • Prototyping • Mass Production
- Technical Testing & Validation

Prof. Dr. Özge Kerkez Kuyumcu

Marmara University, Türkiye

- MOF, MPF & e-MPF Synthesis • Pilot-Scale Synthesis
- Technical Testing & Advanced Analysis

The problem we are addressing

Need for Lightweighting & Fire Safety

- EV sector demands lightweight materials to reduce energy consumption and boost range.
- Stricter regulatory measures enforce rigorous fire safety standards.
- EV battery enclosures require advanced FR and HFR-doped PP polymers.
- Traditional flame retardants increase weight and degrade mechanical properties.

Advanced MOF/MPF Masterbatch Solution

- Market seeks low-dosage, high-efficiency additives for lightweight safety.
- Project synthesizes surface-modified ZIF-8 (metal organic frame) MOF, zinc-phosphonate MPF, and e-MPF (encapsulated-MPF).
- Novel masterbatch overcomes the weight limitations of conventional fillers.
- Innovation delivers high-performance, lightweight, and flame-retardant PP composites.



Current polymer technologies face a major challenge: achieving high flame retardancy often increases weight or reduces material strength.

The automotive and EV sectors are actively seeking a balanced solution—advanced fire safety that maintains structural integrity while supporting lightweighting goals. Our consortium aims to address this specific technology gap through the development of next-generation MOF/MPF masterbatches. We have built our partnership specifically to align with the core objectives of this funding call.

Our approach, at concept level

Enhance Material Performance & Lightweighting

Introduce high-efficiency MOF/MPF Masterbatch at low dosages, minimize the dependency on heavy mineral fillers, reduce overall component weight and decrease energy consumption during industrial compounding.

Keep the Production Sustainable & Safe

By reinforcing MOF/MPF metal organic structures into the PP polymer matrix, flame retardancy will increase and overall consumption of HFR will be decreased while preserving mechanical strength of the composite material.

Both rely on three stages

SYNTHESIZE

Develop surface-modified ZIF-8 MOF, zinc-phosphonate MPF, and e-MPF additives at a pilot scale.

COMPOUNDING

Integrate these highly efficient additives into the polymer matrix to develop advanced masterbatches.

PRODUCTION & VALIDATE

Conduct technical testing and advanced analysis on automotive components to ensure compliance with industry standards for high flame retardancy, structural integrity, and lightweighting.

New Product and Process Innovation

Production of Masterbatch

This project introduces a highly innovative, functionalized 10% active metal organic based additives reinforced **PP MASTERBATCH** specifically tailored for high-demanding structural applications like automotive bumpers, appliance interior panels, and EV battery boxes.

Ready-to-Mold Structural PP Compounds

Fully customized, lightweight, and halogen-free flame-retardant (HFR) polypropylene compounds or containing glass fiber reinforced PP and MOF with different ratios, ready for direct injection molding.

Lightweight Solution

A Synergistic Combination of materials will enable weight reductions of up to 7% in glass-fiber-reinforced compounds and up to 4% in compounds containing halogen-free flame retardants (HFR). Additionally, a 20% reduction in HFR usage is anticipated.

Where the consortium stands



Composition

- Marmara University will be responsible for synthesis of metal organic materials MOF, MPF & e-MPF transforming Lab Pilot-Scale to Prototype Scale and Technical Testing & Advanced Analysis
- Tisan Engineering Plastics will develop Masterbatch and Produce Compounds for Injection Moulding Part Production at the Prototype & Serial Scale Validation by Technical Testing
- Minimum one more partner Tier-1 Automotive or EV Supplier is required for final production and validation of OEM parts.

Transnational Eureka Lightweighting Call – 2026

Consortium must include at least two independent legal entities from a minimum of two Eureka Call participating countries. Under this call Spain, Poland, Germany, France, Austria, Belgium, Portugal, Slovakia, Lithuania, South Korea or Ukraine are welcomed for joining to projects.

<https://www.eukanetwork.org/programmes-and-calls/network-projects/transnational-eureka-lightweighting-call-2026/>

What we are looking for!?

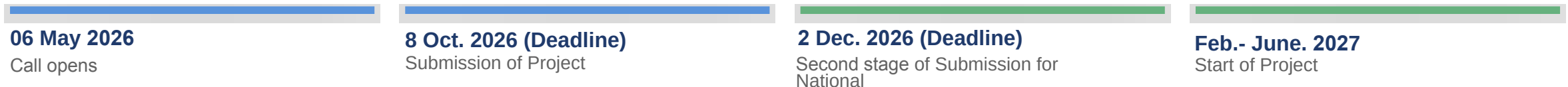
An industrial partner or automotive end user

A partner equipped to mold final components from compounded materials, conduct technical testing, and perform Life Cycle Assessment (LCA) to analyze the carbon footprint, ensuring full commercial viability and environmental compliance.

Project Duration & Timeline

The total project duration is 24 months, structured across three primary phases: synthesis, prototype&serial compound production, and final product&validation.

Timeline



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