FLAMINGO

Fabrication of Lightweight Aluminium Metal matrix composites and validation In Green vehicles

Deliverable D 3.2
Report on the properties of masterbatches powder for the production Al-MMnC

Lead Beneficiary	MBN
Delivery Date	January 31st 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the grand agreement number 101007011

1. Publishable Executive Summary

FLAMINGo targets to reach the market with a material solution that increases the mechanical properties of Aluminium alloys to the point that more steel part can be substituted with this new materials, considerably increasing the lightweight of the vehicles. Such material solutions are based on the introduction of nano-reinforcements in Al-alloys for casting and extrusion, through an effective and safe approach. The manufacturing of Al-based nano-reinforced additives for the production of Aluminium Metal Matrix nano-Composites is then an important activity within the project: these additives have been engineered to ease the dispersion of the nano-particulate in the melt pool, avoiding clustering, and hence enhancing the mechanical properties in the final material. To prove their efficacy and reliability, MBN has started to produce and test several formulations with the casting manufacturing lines in ÖGI and Brunel University.

After processing different types of additives in casting trials, the first results of the characterization on processed material are used as feedback to MBN to improve the additive composition and morphology. So far, more than 5 different types of additives formulations have been released, testing nanoparticles with different chemistry and sourcing (nano-Al_2O_3 and nano-SiC, among others). MBN is also working on combining in a single step the formulation of the additive and the mechanochemical synthesis of carbide nano-reinforcement. This approach potentially brings several benefits, including a potentially drastic reduction of nano-additive costs. Further casting trials and mechanical tests will then drive the material selection, towards the scale-up foreseen in the following activities.