Invitation to the 99. AMAP Colloquium

Presentation by

Dr. Hendrik-Jan Brinkman

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Reversing the Automotive Weight Spiral: at Zero Cost Penalty / an Update from Alumobility

on Wednesday, ***October 29th, 2025 at 4.00 pm***
with subsequent discussion.

All interested persons are sincerely invited to the Colloquium.

Please Note: The 99th Colloquium will take place on Wednesday, as part of our Tri-annual AMAP Joint Innovation Meeting at Novelis Koblenz GmbH.

All guests are invited to participate online via Zoom.

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Reversing the Automotive Weight Spiral: at Zero Cost Penalty / an Update from Alumobility

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Abstract

Alumobility, the non-profit organization for demonstrating the advantages of using aluminum in the automotive industry, already introduced our activities previously to AMAP members. We explain, again, our basic message “Less is more” on various aspects and show how we have continued to verify the benefits of aluminum-intensity in even more theoretical case studies.

This year, also for AMAP, we focus on presenting the outcomes of our largest study so far, conducted in collaboration with a global OEM, with one of their North American steel-intensive battery electric vehicles (BEVs) SUVs as the reference vehicle. The project explores the potential of transitioning from steel to aluminum for key vehicle systems, focusing on the opportunities for primary and secondary mass reduction, vehicle performance, efficiency, value in use, and life cycle analysis (LCA).

From initial aluminum conversion of the steel-intensive systems we carried on maximizing benefits in the second phase of Designing for Aluminum. This included reducing part counts, joint complexity, and material grade variations. The team assessed the potential capital expenditure (CAPEX) and operational expenditure (OPEX) advantages of an Aluminum-Intensive Vehicle (AIV) relative to the steel-intensive baseline.

This phase also demonstrated production-ready technology solutions, leveraging aluminum sheets, extrusions, and castings to achieve optimal weight and complexity reductions while meeting agreed-upon safety, NVH (noise, vibration, and harshness), and structural performance criteria. The feasibility of part design and joining technologies was integral to this phase, ensuring readiness for large-scale production.

Performance and Environmental Impact: Value-in-use and LCA studies highlighted the advantages of primary and secondary weight reductions, using FastSim efficiency models to analyze the potential for downsizing battery packs and motors relative to the reference steel vehicle. These changes resulted in measurable cost and CO2e reductions. Additionally, further weight and cost reductions were identified in chassis motion systems, including drivetrain, brakes, steering, and wheels.

Key Outcomes: The project demonstrated the feasibility of reversing the weight spiral seen in automotive manufacturing over the past 30 years. By implementing an aluminum-intensive design, it is possible to achieve cost-neutral or even cost-saving solutions relative to steel-intensive designs. These innovations improve the environmental impact of future BEVs, using fewer materials during production and consuming less energy throughout the use and end-of-life phases.

Conclusion: This study underscores the transformative potential of aluminum in automotive manufacturing. By integrating innovative design and production strategies, automakers can deliver lightweight, efficient, and sustainable BEVs that meet consumer and environmental demands. Alumobility's findings present a compelling case for adopting aluminum-intensive vehicle systems, paving the way for a more sustainable and cost-efficient future for electric mobility.

Please note: We will also present details on the mentioned study at the upcoming Euro Car Body 2025 conference in Bad Nauheim on Thursday, 16 October.