The application of composites in Urban Air Mobility platforms

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Urban Air Mobility (UAM) means the exploitation of the third dimension for an efficient and effective use of urban and peri-urban spaces as an additional segment of mobility integrated with surface traffic (trains, cars, metro). It represents a fundamental step in the transformation of the aviation sector towards zero-emission mobility and a vital pillar for multimodal transport solutions that will change the way we travel. Urban Air Mobility (UAM) vehicles are typically small, electrically/hybrid-powered aircraft designed for short-distance urban or peri-urban transportation. CFRP (Carbon fiber-reinforced polymers) composites do have tailorable and high specific mechanical properties which compared to aluminum allow to reduce weight by 20-45%. They also increase corrosion, fatigue, and impact resistance, while reducing onboard perceived noise and vibrations. CFRPs may play a multifaceted role in UAM vehicles, contributing to their structural integrity, lightweight design, durability, aerodynamic efficiency, passenger comfort, safety, and overall performance in a urban environment. DAC with the involvement of some members is fostering the concept of a bespoke platform concept: the Disruptive Vertical high-density thrust Autoplane (DIVA). This platform will allow air travelling by taking off and landing vertically with no exposed propellers which are completely integrated within a typical car body. Composites play a paramount role in DIVA structure development. Multifunctional, lightweight, high performing (temperature, mechanical properties) and sustainable composites developed in the REPOXYBLE project (Horizon Europe, GA 101091891) offer a flexible and adaptable solution for different composite aerostructure applications.