An overview of hydrogen storage for airborne applications

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Abstract. The aviation industry is confronted with environmental challenges, driving the need for aircraft technologies aligned with climate goals. Hydrogen has emerged as a promising clean energy carrier, offering significant advantages in supply potential and sustainability. Reliable and safe storage solutions are essential for integrating this fuel into aircraft design. This paper reviews current storage technologies for hydrogen in aviation, emphasizing tank materials and structural aspects to enable sustainable fuel use. The requirements for integrating fuel systems into existing or new aircraft architectures are analysed, considering both gaseous and liquid hydrogen storage. Both high pressures and cryogenic storage conditions are explored. Materials for hydrogen tanks are reviewed, with a focus on improving efficiency and addressing issues like thermal insulation and hydrogen embrittlement.