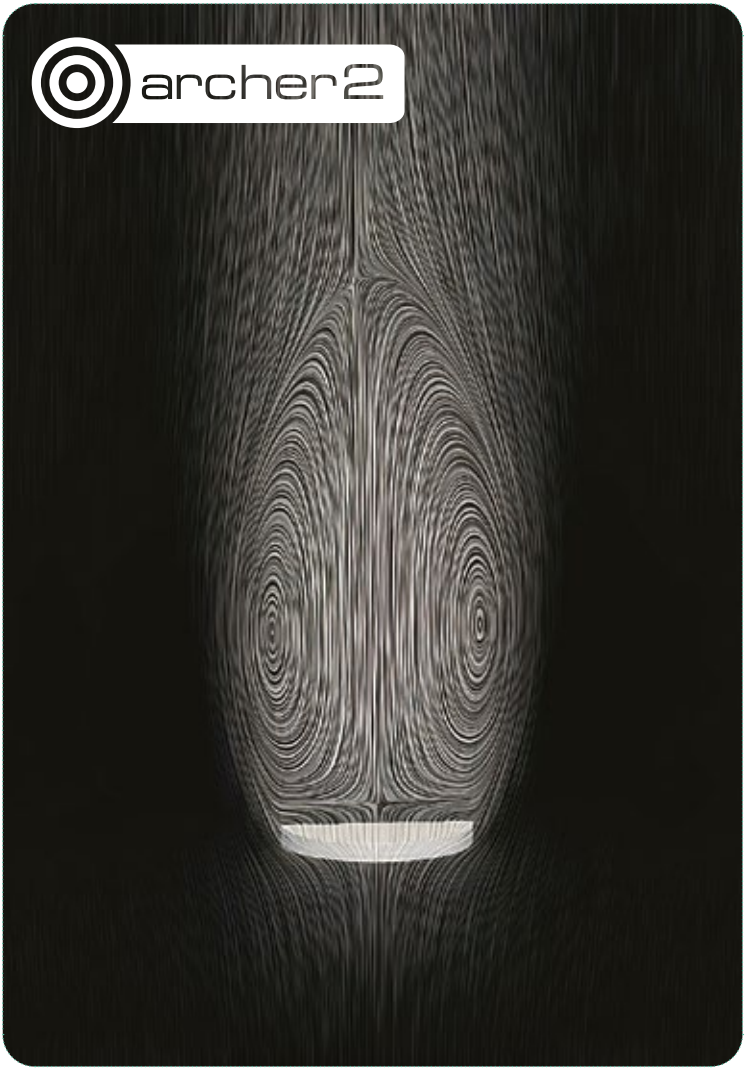
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Separated vortex ring above a three-dimensional porous disc

The primary motivation of studying the wake of a permeable disc stems from the idea of uncovering the role of porosity and permeability on the wind dispersal of biological seeds, such as dandelions. A stable separated vortex ring (SVR) forms in the wake of dandelion seeds, promoted by a filamentous pappus at the head of the seed, having porosity > 0.9. An SVR with a similar topology is also observed behind permeable disks with uniform permeability and porosity. Its existence is, however, limited within a specific range of the Reynolds number, and the Darcy number. The SVR is a stable toroidal vortex, whose closed streamlines are separated from the solid body. This flow feature is correlated with the high drag per projected area of the dandelion, that is an order of magnitude higher than that of an impervious disk with an equal area.

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