

CASE STUDY: EVOVE

The Brief

EvoVe is a driven team of pioneers, serving society with superior filtration and separation technologies. The company are harnessing the power of advanced materials, engineering, additive manufacturing and AI to accelerate and deliver perfect membranes.

During liquid filtration processes like water purification and desalination, polymer and ceramic membranes are commonly used as a filtration and separation barrier. Conventional filtration membranes have random microstructures and pore sizes, resulting in rapid dirtying and polluting and sub optimal filtration. This causes significant inefficiency, over engineering and unnecessary energy cost.

EvoVe want to re-design filtration membranes to address these fundamental challenges. Their work aims to significantly reduce power usage, costs and the environmental impact of water treatment processes.

The Approach

Software Engineers at the STFC Hartree[®] Centre worked with EvoVe using their expertise in computational fluid dynamics (CFD) to explore how CFD help accelerate the design process of the EvoVe Separonics[®] - their new semi-permeable membranes.

CFD transformed membrane design by allowing the team to trial new geometries using computer simulation, removing the need to physically build and test all potential membrane design candidates in the lab.

The ability to generate detailed simulations of how fluids pass through new membrane structures offered insight into the potential design optimisations that could be adopted by EvoVe. This approach showed that CFD and simulation can be used to accelerate the design process for the Separonic[®] membranes, reducing reliance on expensive and time consuming prototype testing.

The Benefits

Using the power of simulation to model and test highly detailed membranes helped Evove to explore their membrane designs virtually, reducing costs associated with physical prototyping. By accelerating the design process, Evove's customers can rapidly implement more effective membrane filters, which increasing efficiency and reducing power wastage, ultimately helping to meet climate change targets.

The collaboration between Evove and the Hartree Centre will continue, using CFD modelling to explore how the design of Separonic membranes can be further optimised as they are deployed globally in the transition to a net zero economy.

“Lab testing has shown these designs have a strong correlation with the Hartree Centre models, which has provided confidence in Evove's understanding of optimising a new generation of membrane technologies for industry.”

Continuing our relationship with the Hartree Centre and leveraging the expertise and high performance computing, we will design highly precise filtration membranes that enable resource circularity and significantly cut the carbon emissions of key economic sectors.”

– Tristan Phillips, VP of Engineering at Evove

