

Production of HF membranes with advanced geometric features for ultrafiltration



PLOWNER

- They have created a spinning line to produce HF membranes with enhanced geometry features



IP OWNER

- FilaTech, a world leading manufacturer of spinning lines for membranes is leading the execution

THE CONTEXT

HF membranes for ultrafiltration applications are commercially available in standard HF geometry. Concentration polarization and fouling reduce the performance of the membrane modules over time. Time and cost consuming cleaning cycles are frequently necessary to regenerate the performance of the membranes. Filatech designs standard HF spinneret orifices and fabricates them with lathe and milling machines. Filatech produces spinnerets and spinning lines as well as conducts membrane development projects for their customers. New geometric features in HF membranes are highly desired to reduce the performance loss of the membranes during operation.

THE CHALLENGE

The showcase will use 3D printing techniques to fabricate spinnerets and optionally apply rotation to the spinneret or induce pulsation to the bore flow to create uniquely shaped HFs. A key part is the design of 3D printed metal spinnerets and the production of HF membranes with them. The showcase is conducted in two stages. First, the production of HFs with 3D printed metal spinnerets is successfully shown and the improved performance of the membranes is validated. In the design of the spinnerets, the knowhow of Filatech in industrial spinneret design is included. Secondly, the spinneret is transferred to Filatech and applied at their spinning line. This approach will ensure the application of the geometry concepts at industrial level at Filatech.

KEY DRIVERS OF THE SERVICE: THE VALUE PROPOSITION

The benefits of using rapid prototyping for the production of these spinnarets would bring a lot of advantages to Filatech.

Higher Efficiency from Rapid Prototyping

- makes the process more efficient
- it is more energy efficient
- fabrication of the different geometries is much quicker
- it requires less effort
- it is less expensive

Higher Performance

- custom geometries improve membrane performance
- enhanced fouling performance