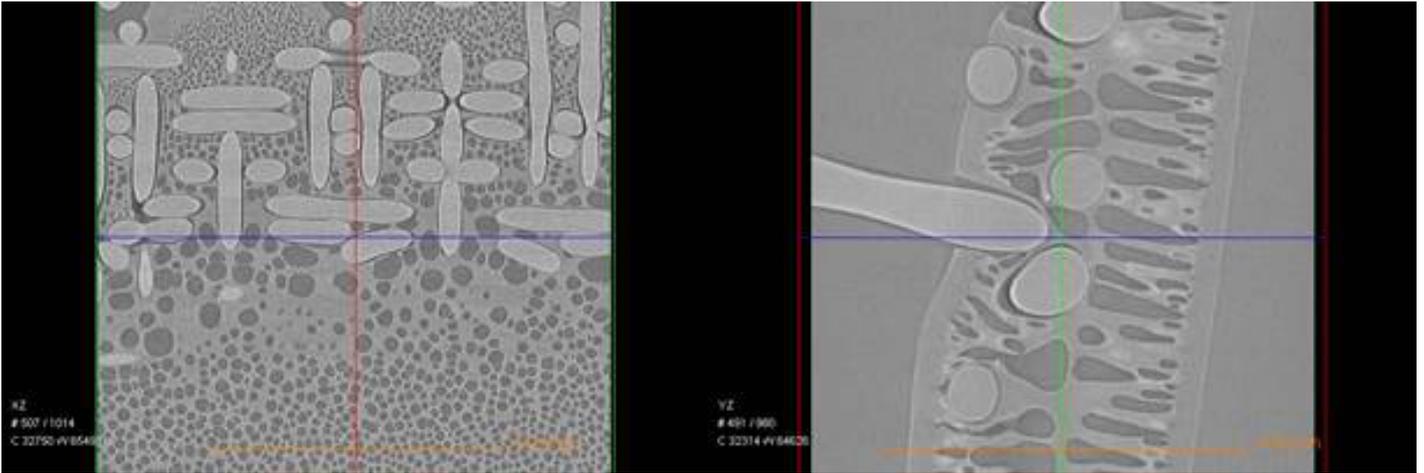


Improved Understanding of Membranes

Grundfos A/S

GRUNDFOS 



Best known for its pumps, Grundfos also explores a number of other water technology solutions, including membranes. The company was in the process of evaluating a new type of membrane for waste water applications together with an international partner. In cooperation with the Imaging Industry Portal at DTU, Grundfos has been able to solve a small mystery regarding these membranes.

“We were puzzled to see that membranes produced at two different locations performed differently despite being manufactured from the same raw materials by principally the same method,” says Allan Hjarbæk Holm, Senior Development Engineer at Grundfos.

Chemical tests showed membranes from the two production sites to be identical, but there was a systematic, significant difference in the stability and long term performance which are key parameters for membranes.

Keen to use ESS and MAX-IV

CT-scans (Computed Tomography) at DTU have revealed a difference in the distribution of tiny porosities inside the membrane polymer material.

“The project was limited in scope, and has not explained what causes this difference, but it is an important step forward, that we can actually see a difference. This will help us in setting up a test regime. In other words we can vary production conditions and evaluate whether the change is positive,” Allan Hjarbæk Holm explains.

“It is a general industry experience that you need to control manufacturing conditions extremely carefully when making polymer membranes, so in that respect we are not unique here. However, it is

good news that we have a tool for improving things now.”

The project also served a larger purpose.

“We were keen to see how advanced materials science facilities could be relevant - not least as new large-scale facilities are being built in Lund, Sweden. The project shows that it will indeed be meaningful in our context,” says Allan Hjarbæk Holm.

More than just spectroscopy

An interesting feature of the ESS and MAX-IV facilities is that they will be able to cover a wide spectrum from traditional hard industry materials over softer materials like membrane polymers, and also biological samples.

“It has not been tradition in waste water treatment to use advanced scientific equipment, but that could be about to change,” Allan Hjarbæk Holm notes.

Such future projects are likely to be performed in cooperation with the Imaging Industry Portal at DTU, the Senior Development Engineer imagines:

“We have seen in the project on membranes that it is not just about the spectroscopy itself. You need some follow-up loops in order to clarify things and obtain value from the experiments. The DTU researchers have proved able to understand the issues we are facing and deliver results in a useful format.”

Grundfos and DTU are currently discussing further joint projects in imaging.



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Allan Hjarbæk Holm, Senior Development Engineer, Grundfos

New Horizons Are Opening to the Energy Sector

World leading facilities within neutron and X-ray scattering, the ESS and MAX IV, will open in the Oresund region over the next few years. However, there is no need to wait for these facilities to open. Scientists at Technical University of Denmark and University of Copenhagen are already in gear for X-ray and neutron scattering projects. These could either be full research projects in their own right or preliminary projects leading up to projects at existing or the coming large scale facilities. Contact the universities to learn more about what they can offer you.

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