European Desalination Society in collaboration with itc INSTITUTO TECNOLÓGICO DE CANARIAS Gobierno de Canarias

EDS WEBINAR

NEW SKIN

NewSkin OITB webinar: Advanced materials, coatings and textures for efficient pumping systems

Tuesday 19. November 2024, 16:00-17:50 CET

Summary:

Open Innovation Test Beds are coordinated efforts supported by the EU that aim to accelerate the uptake of advanced technologies. NewSkin (GA:862.100) main objective is the transfer of advances surfaces and structures to the market. During the 4 years of execution NewSkin has validated a set of technologies that will bring important adavances in pumping systems energy efficiency reducing mechanical, transport and hydraulic loses.

Advanced surfaces and materials allow the design of enhanced components for more efficient pumping systems. Textures and coatings result in friction loses reductions up to a 60% in dynamic components (pistons, shaft and bearings) and seals. Other functional surfaces, like shark skin, result in reduced transport losses (15%), cavitation avoidance and pumping systems efficiency increase (up to a 5%). Finally, graphene enabled oils have demonstrated to improve pumping systems efficiency by over a 20%. All these technologies are available through the Newskin OITB SEP.

Main target(s): main pumping systems manufacturers, piping components, desalination plant operators.

PROGRAM

- The role of graphene nano-enabled oils in pumps. Simone Ligi. (Graphene XT, Newskin Facility user)
- Cavitation – Yan Delaure (Dublin City University, DCU Water Institute, Newskin partner).
- Functional textures and coatings to minimize friction loses in dynamic components. Markus Brase (Leibniz Universität Hannover, NewSkin partner).
- Engineered shark skin surfaces for more efficient desalination. Mikel Lucas García de Albéniz MSc. (Bionic Surfaces, NewSkin facility user)
- NewSkin: An Open Innovation Test Bed to accelerate access to advanced surfaces (Carlos del Castillo, Newskin AISBL, Newskin partner)

SPEAKER INFORMATION

Simone Ligi (Graphene XT, Newskin Facility user)

Bio

Over the past 15 years, Simone Ligi has been at the forefront of innovation in materials science, with a particular focus on the development and industrial application of advanced nanomaterials. His efforts have been instrumental in discovering practical uses for graphene, significantly enhancing the performance and sustainability of various products.

More recently, his work has expanded into the lubricant sector, where he has introduced cutting edge products for both industrial and transportation applications. Through ongoing research and collaboration with global industry leaders, Ligi has established himself as a key figure in advancing nanotechnology and its real-world applications.

Simone received his PhD in 2000 in Industrial Chemistry at University of Bologna, and in 2013 patented the graphene production technology.

He has 17 patents and has published several papers in peer-reviewed journals on catalysis and graphene applications.

Yan Delaure (Dublin City University, DCU Water Institute, Newskin partner).

Dr Yan Delauré is an Associate Professor (Senior Lecturer) in Fluid Mechanics in the School of Mechanical and Manufacturing Engineering at Dublin City University (DCU) and the Deputy Director of the DCU Water Institute. He received his PhD from University College Cork in 2001 and holds a Diplôme d'Ingénieur in Aeronautical Engineering from ESTACA, France and a M.Sc. in Marine Resources Development and Protection from Heriot Watt University, Scotland. Prior to joining DCU, he was a research engineer at the Hydraulics and Maritime Research Centre in Cork for a period of 5 years and held a one year post-doctoral

research in multiphase flow at Trinity College Dublin. Dr Delauré has played a leading role in the setup of a research group in the area multiphase flow characterization and the development of dedicated research facilities to support dual computational and experimental research. He has received financial support from Science Foundation Ireland, the Irish Research Council, Enterprise Ireland and the EU FP7 and H2020 programmes. He is currently leading an EI co-funded industrial project and is a Workpackage leader and DCU principal lead on a EU H2020 Research Innovation Action. He has co-authored more than 30 articles in peer-reviewed journals and conference proceedings.

Dr Delauré's primary research interest is the study of fluid systems in engineering and in particular multiphase flows for applications in process aeration and pumping of incompressible single phase and solid laden flows. He has developed in-house flow simulation codes and worked with a range of commercial and open-source solvers including parallel solvers for high performance computations. His interest in un-usual flow processes has required the development of dedicated and specialized experimental systems relying on a range of non-invasive laser based visualization techniques including three components planar PIV, Shadow Sizing and Digital Image Correlation. Experimental capabilities also include a range of hydraulic flow rig for the study of pumping and mixing applications.

Markus Brase (Leibniz Universität Hannover, NewSkin Partner)

Bio

2011-2018 Study of Mechanical Engineering at Leibniz University Hannover
Since 2018 Scientific Research Staff at Institute of Dynamics and Vibration Research

Mikel Lucas García de Albéniz MSc. (Bionic Surfaces, NewSkin facility user)

Bio

Bionic Surfaces Technologies as Lead Engineer in the Computational Fluid Dynamics department. Currently enrolled in research of advanced surfaces in different fields by riblet simulation in fields such as water pumping, marine transport , aviation, industrial fans and francis turbines.

Areas of specialization are mainly related with the Project Management and CFD simulation: aerodynamics, aeroacoustics and heat transfer. Design, product development and optimization are tasks also involved in every day work.
Previous work in BMW and my Aerospace Engineering studies have brought a very strong background to perform my job in Bionic Surfaces Technologies.

Carlos del Castillo (NewSkin AISBL)

Bio

Carlos del Castillo is a Chemical Engineer and MSc in Sustainability and Project Management. With 20 years of experience in Innovation Projects management and execution, he plays the role of Project Manager in the ECCS and NewSkin AIBSL. He is the NewSkin Open Innovation Test Bed Project
Manager, responsible for the project follow-up and the coordination of partners interactions, technical and route to market activities.