



Sustainable nano-modified seawater concrete with enhanced service life

NanoSeaCon

2-DAYS WORKSHOP ON

INTERACTION BETWEEN HYDRATED CEMENT PHASES AND IONS IN SEAWATER-MIXED CONCRETES

22-23rd June 2023

Szczecin, Poland

Hosted & sponsored by:



About NanoSeaCon

World Wildlife Fund issued a warning about the possibility of **two-thirds of the world's population facing a severe freshwater shortage by 2040**. Agricultural, industrial, and domestic consumptions of water contribute to the total freshwater withdrawals worldwide. Concrete is the second-most consumed material on Earth after freshwater. Among the freshwater withdrawals for industrial purposes, **almost 10% of the water is being used for concrete production**. Unfortunately, the most water-stressed nations are the developing countries which need significant improvement in their infrastructure to be achieved through concrete production. Therefore, research on producing concrete with alternate water sources such as seawater is needed during this climate action decade proposed by the United Nations.

Project **NanoSeaCon** aims to develop sustainable seawater concrete (SWC) with enhanced service life. The synergy between reactive SCMs and nanoparticles can enhance the impermeability of the produced concretes. A holistic assessment of the nano-modified SWC will be carried out by evaluating the fresh, mechanical, and durability properties. Also, an electrochemical assessment of embedded steel in nano-modified SWC will be performed to understand the role of SCMs and nanoparticles in mitigating corrosion initiation. The success of **NanoSeaCon** can encourage the industry to produce reinforced concrete with seawater. Thus, this work can contribute to one of the many efforts taken across the world to tackle the global freshwater shortage and cater to the UN Sustainable Development Goals (SDGs).

Webpage: www.nanoseacon.zut.edu.pl

Twitter: [www.twitter.com/NanoSeaCon1](https://twitter.com/NanoSeaCon1)

SCIENTIFIC COMMITTEE

Prof. Pawel Sikora	WPUTS
Prof. Radhakrishna G. Pillai	IIT Madras
Prof. Sang-Yeop Chung	Yonsei University
Prof. Mohamed A. Elrahan	Mansoura University
Dr. João Nuno Pacheco	c5Lab
Dr. Murugan Muthu	Wroclaw Univ. of Tech.
Dr. Sivakumar Ramanathan	University of Miami
Dr. Petr Lehner	VSU Ostrava
MSc Aleksandra Ludwiczak-Sarzała	Betotest Polska

ORGANIZING COMMITTEE

Dr. Sundar Rathnarajan	WPUTS
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Dr. Krzysztof Cendrowski	WPUTS
MSc Mateusz Techman	WPUTS
MSc Karol Federowicz	WPUTS
BSc Wojciech Stawowy	WPUTS

REGISTRATION

Participants willing to attend the workshop shall contact the organizers directly through e-mail or register using the Google Form link given below.

Dr. Sundar Rathnarajan - srathnarajan@zut.edu.pl
Prof. Paweł Sikora – pawel.sikora@zut.edu.pl

<https://forms.gle/3JbzmG8B6H6NCij39>

Use the link above to register for this hybrid event.

An online link to join the workshop will be shared with the participants one day before the event.



PROGRAM SCHEDULE

THURSDAY, JUNE 22

13:00-14:00 Lunch with delegates & speakers

14:00-16:00 Betotest Lab. - Technical visit

FRIDAY, JUNE 23

09:00-09:30 Registration for participants

Session 1: Chloride-ingress: Seawater exposure

09:30-10:00 Prof. Radhakrishna G. Pillai

Chloride-induced corrosion of steel in reinforced concrete structures

IIT Madras, Chennai, India

10:00-10:20 Dr. Petr Lehner

Evaluation of chloride transport parameters in concrete

VSB Ostrava, Czechia

10:20-10:40 Dr. Swathy Manohar

(Online) Salt crystallization in marine structures exposed to seawater

IIT Bombay, Mumbai, India

10:40-11:00 Coffee Break

Session 2: Seawater-mixed concretes

11:00-11:20 Dr. João Nuno Pacheco

Seawater sea-sand recycled aggregate concrete: a low critical raw material consumption solution for sustainable energy generation

c5Lab – Sustainable construction materials association, Portugal

11:20-11:40 Prof. Sang-Yeop Chung

(Online) Microstructural investigation of mortars incorporating cockle shell and waste fishing net

Yonsei University, South Korea

11:40-12:00 Prof. Mohamed Abd Elrahman

(Online) Seawater-mixed lightweight aggregate concretes with alternative materials – Experimental and life cycle analysis

Mansoura University, Egypt

12:00-13:15 Lunch break

Session 3: Ways to improve the durability of seawater-mixed concrete

13:20-13:40 Dr. Murugan Muthu

Graphene engineered cementitious composites in improving the durability of cementitious systems

Wroclaw University of Technology, Poland

13:40-14:00 Dr. Yuvaraj Dhandapani

(Online) Chemical alterations of concrete exposed to seawater and influence of supplementary cementitious materials on chloride binding.

University of Leeds, UK

14:00-14:20 Dr. Oleksandr Konstantynovskyi

(Online) Structure formation process control of alkali-activated cements mixed with seawater

KNUCA, Kyiv, Ukraine

14:20-14:40 Dr. Sripriya Rengaraju

(Online) Smart aggregates for marine environment

University of Cambridge, UK

14:40-15:00 Coffee break

15:00-15:20 Dr. Sivakumar Ramanathan

(Online) Properties of concrete made with fly ash mixed with seawater

University of Miami, USA

15:20-15:50 Dr. Sundar Rathnarajan

NanoSeaCon - Ternary blends for concrete mixed with seawater

WPUTS, Poland

15:50-16:00 Concluding remarks – Prof. Pawel Sikora

MEETING VENUE:

The meeting will be held in the Regional Centre for Innovation & Technology Transfer (RCIIT) of WPUTS
Address: Jagiellońska 20-21, 70-363 Szczecin, Poland

FUNDING INFORMATION



This research program is part of the project No. 2021/43/P/ST8/00945 co-funded by the National Science Centre and the European Union Framework Programme for Research and Innovation Horizon 2020 under the Marie Skłodowska-Curie grant agreement no. 945339.

