






Department of Civil Engineering
The University of Hong Kong

Distinguished Public Lecture (ONLINE)

Active Rheology and Stiffening Control of Cementitious Materials

 Date: May 3, 2023 (Wednesday)

 Time: 4:00 p.m. Beijing, Hong Kong

 Zoom: <https://hku.zoom.us/j/97136310777> (Meeting ID: 971 3631 0777)

Moderator: Dr. Ye QIAN

Professor Geert De Schutter

Head of Department of Structural Engineering and
Building Materials, Ghent University, Belgium



Abstract

Rheological properties of fresh cementitious materials to a large extent depend on mix design and processing, currently leaving only limited options to actively modify these properties during or after casting. Cutting-edge research is currently ongoing at Ghent University, fundamentally studying and developing advanced active rheology control (ARC) and active stiffening control (ASC) of cementitious materials, based on the application of external signals to trigger an intended response in the material. This presentation will explain the first concepts of ARC and ASC, and will illustrate ongoing research actions. First results at fundamental paste level will be explained, showing the huge potential. However, several challenges remain, like the upscaling to concrete, the applicability of the control signal, and the economy, logistics and safety of a control system on a construction site or in precast industry. Finding solutions to these challenges will lead to marvelous opportunities in general, and for 3D printing more particularly.

About the Speaker

Geert De Schutter, RILEM Fellow and ACI Fellow, is research professor 'Concrete Technology' and Head of the Department of Structural Engineering and Building Materials, Faculty of Engineering and Architecture, Ghent University, Belgium. He is holder of an ERC Advanced Grant, for the project 'SmartCast', studying active rheology control of cementitious materials. He is technical director of the Magnel-Vandepitte Laboratory and former RILEM Director of Development (2009-2014).

He is recipient of several prizes, among which laureate of the Vreedenburgh Award (1998), laureate of the Royal Academy Division Natural Sciences (2000), Laureate of the RILEM Robert L'Hermite Medal (2001), and recipient of the ACI Arthur Anderson Medal (2014). In 2002 he was Invited Professor at Oita University, Japan. From 2008 to 2014, he was also Invited Professor at the University of Cergy-Pontoise, France. In 2012 he was awarded the Francqui Chair at the University of Liège, Belgium. In 2016, he was invited professor at the University of Nantes, France. Since 2014, he is Invited Professor at Tongji University, Shanghai, China.

His research is situated in the following domains: concrete technology, hydration and microstructure development, properties of hardening concrete, durability of cementitious materials, self-compacting concrete, rheology of cementitious materials. He is (co-)author of several books, and author of more than 500 publications in journals and conference proceedings.



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