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Titolo	Simulation of Fresh Concrete Flow [[electronic resource] ] : State-of-the Art Report of the RILEM Technical Committee 222-SCF // edited by Nicolas Roussel, Annika Gram
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Collana	RILEM State-of-the-Art Reports, , 2213-204X ; ; 15
Disciplina	693.852
Soggetti	Building materials Structural materials Mechanics Mechanics, Applied Building Materials Structural Materials Theoretical and Applied Mechanics
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Physical Phenomena Involved In Flows Of Fresh Cementitious Materials -- Introduction -- Is Concrete A Discrete Or A Continuum Material? -- Macroscopic Rheological Behavior -- Multi-Scale Approach -- Particle Interactions -- Stability And Static Segregation -- Dynamic Segregation And Granular Blocking -- Fiber Orientation And Induced Anisotropy -- Thixotropy And Transient Behavior -- Behavior At The Walls -- References -- Computational Fluid Dynamics -- Introduction To Computational Fluid Dynamics -- Material Behaviour Law -- Solving A Fluid Problem -- Analytical Solutions -- Numerical Solution -- Simulation Of Fresh Cementitious Materials -- References -- Simulation Of Fresh Concrete Flow Using Discrete Element Method (Dem) -- Introduction -- Discrete Element Method -- Simulating Concrete Flow Using Dem -- Calibration And Verification -- Industrial Applications -- Future Perspectives -- Summary -- Rerefences -- Numerical Errors In Cfd And Dem Modeling -- Introduction -- Basics Of Cfd – Understanding The Source Of Errors

-- Numerical Errors (E1) -- Coding Errors (E2) -- User Error (E3) --  
Error From Input Uncertainties (U1) -- Physical Model Uncertainty (U2)  
-- Sources Of Numerical Error In Dem Simulations -- References --  
Advanced Methods And Future Perspectives -- Introduction -- Case  
Studies -- References.

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## Sommario/riassunto

This work deals with numerical simulations of fresh concrete flows. After the first introductory chapter dealing with the various physical phenomena involved in flows of fresh cementitious materials, the aim of the second chapter is to give an overview of the work carried out on simulation of flow of cement-based materials using computational fluid dynamics (CFD). This includes governing equations, constitutive equations, analytical and numerical solutions, and examples showing simulations of testing, mixing and castings. The third chapter focuses on the application of Discrete Element Method (DEM) in simulating the flow of fresh concrete. The fourth chapter is an introductory text about numerical errors both in CFD and DEM whereas the fifth and last chapter give some recent examples of numerical simulations developed by various authors in order to simulate the presence of grains or fibers in a non-Newtonian cement matrix.

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