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Publication date:
2016

Document Version
Publisher’s PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
Materials, Systems and Structures in Civil Engineering 2016
- Post event description of MSSCE2016 and the RILEM week 2016

Technical University of Denmark (DTU), Lyngby, 15 August – 29 August 2016
Event chair: Ole Mejlhede Jensen

October 2016
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Cover: The event help-desk manned by Anisa Sheriff and Julie Smed Hansen – supported by Sabina Askholm Larsen – prepares for arrival and registration of the participants. (Credit: Simon Klein-Knudsen).
Overview of MSSCE2016

Summary

The event Materials, Systems and Structures in Civil Engineering 2016, MSSCE2016, was held in Lyngby, Denmark at the campus of the Technical University of Denmark 15-29 August 2016. The event consisted of a series of parallel and consecutive conference and doctoral course segments on different topics and a number of scientific and administrative meetings. Additionally technical tours were offered to the participants. Each of these event categories are described in details in separate sections of this report.

Each conference or doctoral course segment functioned in principle as an individual event, but they also had relations to other segments of the full event. In particular there was thematic links between specific doctoral courses and specific conference segments. Each conference and doctoral course segment was organized by a person from the Technical University of Denmark, DTU Civil Engineering or the Danish Technological Institute, DTI and typically involved cooperation with one or more international key-persons and possibly an international organization.

MSSCE2016 included the RILEM week 2016, which is the main annual event of the scientific organization RILEM. In addition to the scientific support from RILEM, MSSCE2016 was supported scientifically and financially by several other organizations and private foundations.

MSSCE2016 was considered very successful as it fulfilled its main aims. These included having an event with a scientifically wide scope, but still of high scientific quality, and to have a tight integration of scientific and educational elements.

Approximately 570 persons coming from about 55 different countries were scientifically involved in the event.
Involvement of RILEM and other scientific organizations

MSSCE2016 included the yearly main event of RILEM, the RILEM week. RILEM is an international scientific organization in the area of construction materials, systems and structures. RILEM has about 1300 members from 70 countries. RILEM was established in 1947 and is a framework for progress of science through conferences, educational courses, scientific publications, work in technical committees etc. The RILEM week takes place in different locations each year: 2009: Haifa (Israel), 2010: Aachen (Germany), 2011: Hong Kong (China), 2012: Cape Town (South Africa), 2013: Paris (France), 2014: Sao Paulo (Brazil), 2015: Melbourne (Australia). The RILEM week consists of several parts, notably:
1) A series of administrative meetings in the standing committees and organs of RILEM.
2) Meetings in some of the approximately 40 RILEM Technical Committees.
3) Presentations by some of the RILEM Technical Committees and RILEM medalists (Technical day).

The chairs of each doctoral course and conference segment were free to involve other scientific organizations than RILEM in their segments, and these scientific organizations were also encouraged to have administrative and technical meetings during MSSCE2016. Other scientific organizations with various degrees of involvement in MSSCE2016 were COST (the European Cooperation in Science and technology), the International Association of Building Physics, and buildingSMART.

MSSCE2016 main figures

Approximately 590 persons were involved in MSSCE2016. Some of these were not registered in the event management system, but instead registered separately (20-25 persons on RILEM scientific meetings, 9 teachers on the doctoral courses, 62 persons on COST meetings). Excluding accompanying persons and DTU Civil Engineering administrative personnel (conference coordinators) registered in the event management system, in total about 570 persons participated scientifically in the event.
Apart from the technical tours, MSSCE2016 consisted of four main event categories with a total of approximately 900 “participant events”:
1) Conference, approx. 390 participants in 13 segments.
2) Doctoral courses, 106 participants in 6 courses.
3) Scientific committee meetings, approx. 270 participants who took part in one or more of the 18 different meetings, each with a duration between a couple of hours up to 2 days. Some individuals participated in up to 9 different meetings.
4) Organizational, administrative meetings, approx. 130 participants who took part in one or more of the 18 different meetings, each with a duration between a couple of hours up to 2 days. Some individuals participated in up to 6 different meetings.

About half the participants took part in only one of these different main event categories, but the other half were involved in two, three or even four of these. Among the doctoral course participants, approximately 50% also participated in the conference. All event categories had participants from all continents.

From the conference, 9 sets of printed proceedings (one of these is in two volumes) have been published and 2 more are in the editorial process. The proceedings have been made freely downloadable on the MSSCE2016 website. The proceedings that have been printed so far contain 267 papers and 12 abstracts.

Planning of the event was under way for 5 years. Its organization was internally pre-approved at DTU Civil Engineering in September 2011, by RILEM in March 2012 and formally approved at the Cape Town RILEM General Council meeting in September 2012.

In round figures the total event budget was 5.000.000 DKK if expenses such as room rent and event organizational wages were to be included. However very significant indirect support was allocated by a number of sponsors and the event revenue was approximately 2.500.000 DKK.

Financial Sponsors

As mentioned above MSSCE2016 was scientifically sponsored – i.e. a non-financial “seal of approval” of the scientific quality of the event – by several scientific organizations with various degrees of involvement in MSSCE2016: RILEM, COST, the International Association of Building Physics, and buildingSMART.

Support which can be characterized as “financial” came from several sources. In some cases it consisted in a direct, cash grant, unrestricted in its use for the full event. In other cases the grant was limited e.g. to certain segments of the event, or the support was more indirect in the form of for example free services or manpower. The following list of financial sponsors does not distinguish between these different forms:
In all cases the involvement by the sponsors in MSSCE2016 was non-commercial, and likewise the event was free from commercialism: There was no commercial exhibition booths, no display of commercial logos etc.

Aims and evaluation

Every institution and organization involved in MSSCE2016 (RILEM, DTU Civil Engineering etc.) have had their specific aims with the event. From the point of view of the event organization the stated goals were to have an event which includes the following characteristics:
- Scientific excellence.
- Wide in scope by broadly reaching out to all civil engineering disciplines.
- Broad international participation.
- Foster a strong integration of research education.
- Significant number of participants.

Concerning the scientific level general scientific sponsorship to the full event was granted by RILEM; it was a RILEM event. Additionally, several RILEM TCs and COST actions granted scientific sponsorship to specific conference and doctoral course segments. 70% of the published papers and 80% of the doctoral courses were covered by this additional scientific sponsorship. All papers were anonymously peer-reviewed and thereby fulfilled standards for the highest scientific level.

During planning of an event there are some conflicting elements between having a wide scope, a significant number of participants, international participation and scientific excellence. For MSSCE2016 this dilemma was overcome by the segmented, “multi-focus” structure; each segment was focused and could thereby keep the highest scientific level and attract international experts, and meanwhile the sum of segments ensured a high attendance level. High attendance is a motivator for everyone since it increases visibility. The RILEM TC participation was the highest during a RILEM week. As a further indicator of the broad scope, all sections at DTU Civil Engineering were involved in the Organization of MSSCE2016.

The segmented structure and the multiple activities were by no means a “separating factor”, on the contrary it ensured “added value” for the participants. During the program planning submitted papers were transferred between segments and during the event some scientists participated in and made presentations in several segments. As mentioned about half the participants took part in more than one event activity and notably half the doctoral course participants also took part in the conference. Clearly there was a very good integration between the different parts of MSSCE2016, and the variety of activities has surely promoted participation.

As documented later in this report a separate evaluation of the doctoral courses were made by the participants and these were clearly successful.

In summary, MSSCE2016 was very successful and fulfilled its main aims.
Conference

Overview

The conference part of MSSCE2016 involved several segments on different topics. Each segment was organized by an academic employee from DTU Civil Engineering or from the Danish Technological Institute, DTI, in cooperation with a number of co-organizers from other institutions primarily outside Denmark. A total of 390 persons participated in one or more of the 13 segments. The following 13 conference segments with a total of 346 presentations took place:

<table>
<thead>
<tr>
<th>Conference segment title (shorthand in <strong>bold</strong>)</th>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation of Teaching in Materials and Structures</td>
<td>6</td>
</tr>
<tr>
<td><strong>Reliability, Safety and Value of Information</strong></td>
<td>7 (+23 COST TU1402)</td>
</tr>
<tr>
<td><strong>Service Life of Cement-Based Materials and Structures</strong></td>
<td>80 (two tracks, incl. COST TU1404)</td>
</tr>
<tr>
<td><strong>Historical Masonry</strong></td>
<td>32</td>
</tr>
<tr>
<td><strong>Electrochemistry in Civil Engineering</strong></td>
<td>23</td>
</tr>
<tr>
<td><strong>Moisture in Materials and Structures</strong></td>
<td>38</td>
</tr>
<tr>
<td>Concrete with Supplementary Cementitious Materials <strong>(SCM)</strong></td>
<td>41 (+5 joint with COST TU1301)</td>
</tr>
<tr>
<td><strong>Frost Action in Concrete</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>Fresh Concrete</strong></td>
<td>23</td>
</tr>
<tr>
<td><strong>Cold Region Engineering</strong></td>
<td>12</td>
</tr>
<tr>
<td>Building Materials and Indoor <strong>Environment</strong></td>
<td>8 (+9 joint with COST TU1301)</td>
</tr>
<tr>
<td><strong>BIM in Civil Engineering</strong></td>
<td>13</td>
</tr>
<tr>
<td><strong>RILEM Technical Day</strong></td>
<td>6</td>
</tr>
</tbody>
</table>

A significant part of the presentations were related to a full paper published in the conference proceedings. In addition to the presentations in the conference segments a key-note was given during the event opening by Professor Jan Søndergaard from the Royal Danish Academy of Fine Arts, and a number of speeches were given by the hosts and organizers during the event opening, segments and social events. Also many segments involved several organized workshop plenum discussions.

An example of a conference segment program is given below – all conference segment programs are shown in the appendix section.
Segment contents

MSSCE2016 contained the following conference segments (descriptions are based on the segment folders shown in the appendix section):

**Innovation of Teaching in Materials and Structures**

Innovation of teaching in the field of materials and structures is one of the most important activities at a technical university. Innovation is as such required to produce better candidates with constantly less resources available, while at the same time accommodate for the changing requirements. Contributions to the conference segment dealt with experiences and/or plans for the teaching and learning of topics within the fields of materials and structures. Contributions to the conference segment included the following topics: Novel teaching and learning concepts, E-learning in theory and in practice, MOOC courses with local activities, Blended E-learning, Experimental activities, Students labs, CDIO and innovation activities, Flipped classroom, Distance learning, International courses, Teaching students with different nationalities, Courses shared by several universities, Project families, supervision and research.

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![Figure 5. Example of conference segment program, in this case for Moisture in Materials and Structures. Red colored activities are specific to this segment. In the “empty” slot late Wednesday afternoon several other segments had activities available also for the participants on this segment, cf. Figure 1.](image-url)
Reliability, Safety and Value of Information

Over the past 4-5 decades the research field of reliability and safety in engineering has progressed significantly and now forms the foundation for most best practices, leading standards, codes and regulations in engineering. Contemporary challenges associated with the need for sustainable societal developments and mitigation of, and adaptation to climate change calls for increased efforts on the identification of rational, safe, reliable and economical engineered solutions. Contributions to the conference segment included the following topics: Uncertainty modeling of loads and resistances, Probabilistic modeling of structural response, Probabilistic modeling of deterioration, Optimization and service life analyses, Risk informed decision making, Value of information analyses, Structural robustness, Probabilistic systems modeling and analysis, Natural hazards modeling and management, Life safety, regulation and standardization, Risk acceptability and risk communication.

Service Life of Cement-Based Materials and Structures

The main objective of COST Action TU1404 is to bring together researchers and practitioners in the pursuit of knowledge integration for better understanding of the service life of cement-based materials and structures. This conference segment was dedicated to the discussion and dissemination of relevant results of Action members, but also from any researcher or practitioner reporting work related to the Workgroups and Group Priorities of the Action. Contributions to the conference segment included the following topics: Fresh properties and setting, Chemical / microstructural characterization, Transport properties and boundary effects, Mechanical properties (including creep), Volume stability, Fracture properties and cracking, Multi-scale models, Multi-physics macroscopic modelling, Modelling assumptions, Product development for testing/monitoring, Product development for software, Reliability considerations, Recommendations, pre-standard documents.

Historical Masonry

A significant part of historical structures are erected in masonry. The long service life of historical masonry stipulates special demands on durability, repair and conservation issues. This conference segment served as a platform for dissemination of state-of-the-art knowledge and created a forum for knowledge transfer within historical masonry. Contributions to the conference included the following topics: Characterization of Masonry Materials, Reproduction of Traditional Composites, Optimization of Masonry Composite Materials, Strength and Durability, Measurement Techniques, Mechanisms of Masonry Decay, Damage analysis and assessments, Repair, Restoration and conservation.

Electrochemistry in Civil Engineering

Electrochemistry is the discipline of chemical reactions taking place at the interface of an electrode and an ionic conductor including the electric charges moving between the electrodes. Electrochemistry is important to different branches within civil engineering, and this includes both the unintended reactions as reinforcement corrosion and the intended reactions driving electro-desalination of construction materials. This conference segment emphasized the application of electrochemistry to technological development as well as testing and fundamental understanding within civil engineering. Contributions to the conference segment included the following topics: Reinforcement corrosion, Electrochemical repair techniques, Electrochemical methods, Electrokinetics in geotechnical engineering.

Moisture in Materials and Structures

Properties and performance of building materials and structures are to a large extent influenced by the moisture conditions in the materials. Obvious examples are thermal conductivity, shrinkage and creep, transport properties, discoloration, emissions to indoor air, most types of deterioration and service-life. Prediction and measurements methods are essential and must be based on a thorough understanding of moisture and quantified material properties and boundary conditions. Contributions to the conference segment included the following topics: Pore structure and moisture properties, Properties of materials and structures, Experimental methods and results, Methods and methodology for moisture measurements in
Concrete with Supplementary Cementitious Materials

Hydraulic and pozzolanic industrial by-products, natural resources and societal waste are increasingly being used as valuable, supplementary cementitious materials (SCMs) in concrete. Materials such as fly ash, blastfurnace slag, silica fume, calcined clay and limestone are important to obtain concrete with improved and targeted properties and not the least to make the construction industry more sustainable and less CO₂-intensive. Contributions to the conference segment included the following topics: Characterization of SCMs, SCM reactivity in blended cements, Cement-SCM interaction, SCM-admixture interaction, Hydration products, Pore solution composition, Effect of SCM on fresh concrete, Hardened concrete with SCM, SCM influence on microstructure, Durability of concrete with SCM.

Frost Action in Concrete

Frost deterioration is an aesthetical problem, but the durability aspect is even more important, as this can jeopardize the structural integrity of buildings, infrastructure facilities, etc. Despite research in this field has been ongoing since the 1930’es, the mechanism(s) leading to frost damage is still not fully understood. There is still a need for both basic research and practical solutions to the challenges encountered in the field. This conference segment intended to be a forum for presentations of recent research and discussions on e.g. how current knowledge can be implemented in test standards. Contributions to the conference segment included the following topics: Frost at early age, Methods for testing concrete frost resistance, Air void analysis, Frost damage mechanisms, Modelling of frost action, Experimental observations, Experience from field exposure.

Fresh Concrete

Knowledge and understanding of the fresh concrete properties, the casting process and the development in early age properties of concrete can contribute to improved design, execution planning and quality control ultimately resulting in higher quality of the final concrete structure. For instance, numerical, analytical and empirical based simulation tools are increasingly being used as a valuable supplementary tool in the execution phase of concrete structures and serve as an efficient means towards achieving environmentally friendly and cost effective concrete structures. Contributions to the conference segment included the following topics: Mix design, Constituent materials, Flow of fresh concrete, Rheology of fresh concrete, Segregation of aggregate, Formwork pressure, Thixotropy, Fiber distribution, Fiber orientation, Quality control, Temperature development, Stress development.

Cold Region Engineering

The overall topic of this workshop was research and practical experiences in cold regions engineering. Cold regions are part of the earth system characterized by the presence of snow and ice at least a part of the year.
and include both polar and sub-polar regions. Such harsh climate strongly affects construction and building technology, and in this workshop a broad view was taken. In addition a more focused geographical focus was on engineering in Greenland. The topics are related to buildings, constructions and transportation infrastructure on land and in the arctic marine environment. Contributions to the workshop included the following topics: Innovative approaches to adapt conventional building and construction technologies to cope with the cold climate, Physical constraints for climate adaptation engineering, Climatic effects on mechanical properties of snow, ice, soil and rock, Buildings designed specifically for cold regions, Renovation of residences in cold climate highlighting both energy consumption and indoor environment, Durability of construction materials in cold climate, Arctic coastal and marine structures.

**Building Materials and Indoor Environment**

Building materials have a significant influence on the indoor environmental quality. Emissions from materials will influence the indoor air quality and the requirements for ventilation. Other indoor environmental parameters like acoustic and lighting conditions are influenced by the surface materials used. Contributions to the conference segment included the following topics: Emissions from materials, Indoor climate, Testing of materials, Test standards, Certification, Dynamic calculations of material emissions, Air Cleaning Materials, Air Cleaning, Phase change materials, Acoustic, Lighting.

**BIM in Civil Engineering**

The conference segment focused on the potential for, and challenges in, adopting open data standards in civil engineering. For decades, the civil engineering domain has been a frontrunner in adopting IT not only for design tasks but also for subsequent production on site with machine guidance. However, the industry still faces challenges in sharing and integrating digital data from different sources during the lifecycle of the facilities. Several research and development initiatives have been started at the global, regional and national levels to try to overcome the challenges. The issues to be addressed include a lack of semantic consensus, incompatible data models, the need for geo referencing, the management of data from different data sources, access rights, information delivery specifications and legislation. As it becomes more common to use or mandate delivery of data in open format there is an increasing demand for knowledge on open BIM in the construction industry.

**RILEM Technical Day**

During the RILEM Technical Day a series of presentations related to the ongoing technical work within RILEM were given. At the occasion delegates from four RILEM technical committees presented the State-of-the-art within their topic and drafted the expected ongoing committee work. Also integrated in the RILEM Technical Day RILEM TAC awarded Gustavo Colonnetti Medals to Dr. Ruben Snellings and to Dr. Susan Bernal. The Gustavo Colonnetti Medal is awarded to “researchers of less than 35 years old, who have made an outstanding scientific contribution to the field of construction materials and structures”. Both medalists gave presentations of their scientific work.

*Figure 7. During the RILEM Technical Day chaired by TAC chair, Dr. Nicolas Roussel (right), one of the two “Gustavo Colonnetti medalist 2016” talks was given by Dr. Ruben Snellings (left).*
Financial and scientific support

Scientific approval, so-called scientific sponsorship, of the conference activities have been given by the Technical Activities Committee of RILEM to the entire conference. Additionally COST TU1404 sponsored the segment on Service Life, COST TU1402 was involved in the segment on Reliability, and COST TU1301 was involved in the conference segments on Indoor and SCM. RILEM TC238-SCM sponsored the segment on SCM, and the International Association of Building Physics and RILEM TC248-MMB sponsored the segment on Moisture. All segments were financially supported by the general event sponsors, Knud Højgaards Fond, Larsen & Nielsen Fonden and Ingeborg og Leo Dannins Legat for Videnskabelig Forskning. Direktør Ib Henriksen’s fond, and Kalk- og Teglværksforeningen supported the segment on Masonry. COST actions TU1301, TU1402 and COST TU1404 covered certain expenses on the conference organization related to their specific segments and granted financial support to COST participants travelling, accommodation and meals. Copenhagen City Council sponsored a reception at the Copenhagen City Hall, and Wonderful Copenhagen gave consultancy support. The Technical University of Denmark and the Danish Technological Institute gave administrative and scientific support, and The Technical University of Denmark supplied infrastructure (rooms, IT, AV).

The support was mentioned orally, displayed at the conference, on the event website, and written in the conference proceedings.

Proceedings

From the conference the proceedings listed below have been published in print or are in the editorial process. All papers in the proceedings were anonymously peer-reviewed.


Reliability, Safety and Value of Information, Ed. Sebastian Thöns, (To be published),

Building Information Modeling in Civil Engineering, Ed. Jan Karlshøj, (To be published),
The proceedings have been made available to download freely on the event website, and all RILEM proceedings have also been made available through the RILEM website.

*Figure 8. Proceedings covering the presentations at MSSCE2016 were issued both in print and electronic form.*
Doctoral Courses

Overview

Several doctoral courses took place during MSSCE2016. Each course was organized by a person from DTU Civil Engineering in cooperation with a number of co-organizers from other institutions primarily outside Denmark. A total of 106 participants were registered for the courses. Out of these, the main part, 90 participants, were PhD-students, about 10 were employed in industry, a couple were university professors, and a couple were MSc students. By host institution in total 31 countries were represented by the participants who came from all over the world. The following 6 courses took place:

<table>
<thead>
<tr>
<th>Course title (shorthand in bold)</th>
<th>Registered participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Life of Cement-Based Materials and Structures</td>
<td>33</td>
</tr>
<tr>
<td>Moisture in Materials and Structures</td>
<td>21</td>
</tr>
<tr>
<td>Concrete with Supplementary Cementitious Materials (SCM)</td>
<td>24</td>
</tr>
<tr>
<td>Clay and Shale</td>
<td>10</td>
</tr>
<tr>
<td>Concrete and Radiological aspects</td>
<td>6</td>
</tr>
<tr>
<td>BIM in Civil Engineering – focusing on open standards</td>
<td>12</td>
</tr>
</tbody>
</table>

Figure 9. Some of the course participants and teachers taking a small break from the studies (courses: Service Life, SCM, and Radiological).

Scope and contents of courses

In addition to lectures the courses involved a number of different teaching elements such as preparatory readings, written exercises, hands-on laboratory exercises, report writing, posters and “conference” presentations. Furthermore, the courses included a study tour to a construction site, and social activities during the courses took place to promote a stimulating study atmosphere. In the following the scope and
The contents of the courses are briefly explained (descriptions are from the segment folders given in the appendix).

**Service Life of Cement-Based Materials and Structures**
Service life of cement-based materials is a topic of substantial importance since the maintenance of concrete structures every year necessitates massive investments in rehabilitation and repair. However, constantly ongoing research refines our theoretical knowledge about why deterioration takes place, models for prediction of deterioration are improved, and new measures to prevent deterioration processes appear and extend the service life of concrete structures. The course covered important topics related to service life of cement-based materials and structures with a focus on advanced experimental testing methods including: Hydration and microstructure of cement-based materials; Calorimetry, heat release and setting; Elastic properties; Free shrinkage in autogenous conditions; Creep and relaxation, Evolution of mechanical properties since very early age; Nature of the binder on the sensitivity to cracking; Thermo-mechanical and macroscopic modelling of concrete structures.

**Moisture in Materials and Structures**
Properties and performance of building materials and structures are to a large extent influenced by the moisture conditions in the materials. Prediction and measurement methods are essential and must be based on a thorough understanding of moisture theory, quantified material properties and boundary conditions. The course covered important topics in relation to moisture in materials and structures including: Thermodynamics of moisture; Moisture fixation in materials; Moisture transport in materials and structures; Experimental methods; Moisture measuring methods; Prediction methods; Field applications; Coupled transport phenomena.

**Concrete with Supplementary Cementitious Materials**
Hydraulic and pozzolanic industrial by-products, natural resources and societal waste are increasingly being used as valuable, supplementary cementitious materials (SCMs) in concrete. Materials such as fly ash, blast-furnace slag, silica fume, calcined clay and limestone are important to obtain concrete with improved and targeted properties and not the least to make the construction industry more sustainable and less CO$_2$-intensive. The course covered important topics in relation to the use of SCMs in concrete technology including: Properties of SCM; Mix proportions; Fresh concrete; Hydration reactions; Hardened concrete; Durability aspects.

**Clay and Shale**
Properties of clay and shale as substrate for construction is a field with many question marks. A lack of physical and chemical understanding of properties of these rocks is also critical in the context of sealing membranes and seals in connection with subsurface storage of heat, CO$_2$, and hydrocarbons. Reservoir
properties of shale itself are also a focus of debate. The course covered important topics in relation to properties of shale and clay including: Elasticity; Pore collapse; Creep; Fracturing; Pore water effects; Electrical properties.

Concrete and Radiological aspects

The depletion of energy resources and raw materials has a huge impact on the building market. In the development of new synthetic building materials the reuse of various (waste) residue streams becomes a necessity. This course dealt with research on the reuse of residues containing enhanced concentrations of natural radionuclides (NORM) in tailor-made building materials in the construction sector while considering the impact on both external gamma exposure of building occupants and indoor air quality. The course covered important topics in relation to concrete and radiological aspects including: Concrete and cement properties; Sampling and measurement challenges; Radiological impact assessment models; Radon emanation and exhalation; Use of NORM residues in building materials.

BIM in Civil Engineering – focusing on open standards

Significant improvements in cost, value and environmental performance can be achieved through the use of open sharable asset information in the creation and operation of civil infrastructure and buildings worldwide. BuildingSMART is an open BIM standard which enables this. The purpose of the course is to demonstrate the correlation between content and methods developed by buildingSMART for identification, modelling and implementation of digitally supported information flow between the parties involved in creating and operating buildings and structures in the built environment. The course covered important topics in relation to BIM in civil engineering aspects including: Industry Foundation Classes (IFC); Model View Definition (MVD); Information Delivery Manual (IDM); The buildingSMART Data Dictionary (bSDD); BuildingSMART’s Software Certification procedure and Data Validation based on mvdXML.

Lecturers

The following persons lectured at the courses:
Miguel Azenha, University of Minho, Portugal (Service Life, SCM, Radiological)
Brice Delsaute, Université Libre de Bruxelles, Belgium (assisting teacher: Service Life, SCM, Radiological)
José Granja, University of Minho, Portugal (Service Life, SCM, Radiological)
Ole Mejlhede Jensen, Technical University of Denmark, (Service Life, SCM, Radiological)
Workload, ECTS points and learning outcomes

The workload of each course was approximately 140 hours corresponding to 5 ECTS points, including elements such as the teaching period during the course, readings prior to the course, preparation of personal presentation, and completion of individual posters. The learning outcomes of the participants were evaluated mainly through the individual poster and the plenum “conference” presentations finalizing the courses – or alternatively through writing of individual reports. A certificate of participation was issued to the participants who completed the courses.

Figure 12. Left: Course participants studying each other’s poster during a coffee break. Participant interaction was promoted by requiring them to vote for a “Best poster student prize” (credit: Simon Klein-Knudsen). Right: A group of participants gives a plenum “conference” presentation based on course lectures, readings and lab work.
Course participation required one week of attendance at The Technical University of Denmark, except Moisture where two weeks of attendance was required. An example of an overview course program is given below.

**Concrete with Supplementary Cementitious Materials**

Technical University of Denmark, Lyngby, Denmark, 15-19 August 2016  
Organized by: Ole Mejlhede Jensen, Konstantin Kovler and Nele de Belle

<table>
<thead>
<tr>
<th></th>
<th>Monday 15</th>
<th>Tuesday 16</th>
<th>Wednesday 17</th>
<th>Thursday 18</th>
<th>Friday 19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8:00</strong></td>
<td>1. Introduction to course and presentation of participants (omj)</td>
<td>6. Autogenous deformation Lecture (omj)</td>
<td>10. Hydration of cements Lecture (blo)</td>
<td>14. Sustainability Lecture (ndb)</td>
<td>19. Preparation of participant presentations (omj)</td>
</tr>
<tr>
<td><strong>9:00</strong></td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
</tr>
<tr>
<td><strong>12:00</strong></td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td><strong>14:00</strong></td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
<td>Coffee</td>
</tr>
<tr>
<td><strong>17:00</strong></td>
<td>5. Barbecue</td>
<td>1. Jury meeting</td>
<td>18. Course dinner</td>
<td>Closure</td>
<td></td>
</tr>
</tbody>
</table>

Figure 13. Example of overview program for the course on Concrete with Supplementary Cementitious Materials (SCM).

**Financial and scientific support**

Scientific approval, so-called scientific sponsorship, of the courses have been given by the Educational Activities Committee of RILEM (all courses), additionally by COST TU1301 (Radiological), by COST TU1404 (Service Life), by RILEM TC238-SCM (SCM), and by the International Association of Building Physics and RILEM TC248-MMB (Moisture). All courses were financially supported by the general event sponsors, Knud Højgaard’s Fond, Larsen & Nielsen Fonden and Ingeborg og Leo Dannins Legat for
Videnskabelig Forskning. COST TU1301 and COST TU1404 covered considerable expenses on teacher’s participation in the two courses on Radiological and Service Life respectively. These two COST actions additionally covered support grants to approx. 25 participants. The students and teachers were impressed by the extent of the support. The sponsorships were mentioned orally at the course and written in course material. Furthermore, information was given on the complementary 3-years RILEM membership offered to PhD-students participating in the doctoral course.

Course evaluation

At the end of the courses an evaluation was conducted. About 2/3 of the participants completed the questionnaire which dealt with every module of the courses. On a scale “unsatisfactory, bad, satisfactory, well, very well”, far the majority of the responses were “well” or “very well”. Many students expressed that they found the courses very good and useful for their PhD-studies. Written evaluation comment by a student: “This was the best organized summer school which I have ever attended. Well done! Lab and other exercises are very useful to have.”.

![Figure 14. Left: Evaluation responses by the participants – they were very satisfied with the courses. Right: A happy participant, Mrs. Francesca Lolli, receives her poster presentation “gold prize” during the gala dinner – handed over by Professor Nele De Belie.](image)

Based on the responses received through the questionnaires and personal contacts during and after the course it is concluded that the event was very successful.
Meetings

Overview

Several scheduled meetings took place during MSSCE2016. These were related to the main scientific organizations involved in MSSCE2016: RILEM and COST. Some meetings were short and lasted for 2 hours, other meetings stretched across 2 full days.

RILEM meetings

RILEM Technical committee meetings were attended by approximately 140 persons – some of these participated in up to 9 different TC meetings. 11 RILEM TCs had formal meetings during the event:

ASC: Accelerated laboratory test for the assessment of the durability of materials with respect to salt crystallization. Chair: Barbara Lubelli. 18 participants.
TRM: Tests for reactivity of supplementary cementitious materials. Chair: Karen Scrivener. 17 participants.
238-SCM: Hydration and microstructure of concrete with supplementary cementitious materials. Chair: Nele De Belie. 21 participants.
246-TDC: Test methods to determine durability of concrete under combined environmental actions and mechanical load. Chair: Yan Yao. 12 participants.
248-MMB: Methods of measuring moisture in building materials and structures. Chair: Lars-Olof Nilsson. 15 participants.
258-AAA: Avoiding alkali aggregate reactions in concrete - Performance based concept. Chair: Børge Johannes Wigum. 28 participants.
262-SCI: Characteristics of the steel/concrete interface and their effect on initiation of chloride-induced reinforcement corrosion. Chair: Ueli Angst. 18 participants.

Figure 15. RILEM TC 238-SCM meeting participants enjoy the wonderful Danish weather.
RILEM Administrative meetings during MSSCE2016 were attended by approximately 60 persons – some of these participated in up to 6 different meetings.

EAC: Educational Activities Committee. Chair: R. Doug Hooton. 4 participants.
DAC: Development Advisory Committee. Chair: Geert De Schutter. 14 participants.
TAC: Technical Activities Committee. Chair: Nicolas Roussel. 15 participants.
DEV: Development meeting. Chair Ravindra Gettu. 24 participants.
BUR: Bureau. Chair: Johan Vyncke. 13-16 participants.
GC: General Council. Chair: Johan Vyncke. Approximately 50 participants.

COST meetings

Three COST actions held several different meetings during MSSCE2016.

COST action TU1301, NORM for Building materials (NORM4Building). Chair: Wouter Schroeyers. 35 participants. Scientific meetings: Work Group meeting. Administrative meetings: Core group meeting, Management Committee meeting, and NORM Association meeting.

COST action TU1402, Quantifying the value of structural health monitoring. Chair: Sebastian Thöns. 38 participants. Scientific meetings: 3 Work Group meetings. Administrative meetings: Steering Committee and Advisory Board Meeting.

Technical tours

Three technical tours were arranged for the MSSCE2016 event participants. Although they took place in a relaxed social atmosphere their focus was the technical content. Each tour had approximately 50 participants which were divided into 2-3 groups.

Tour to the Open Air Museum
In addition to general information about the Open Air Museum – creation of the museum, principles for the selection and maintenance of buildings, etc. – the tour involved visits to 5 different farms where specific historic building and construction technical features were shown and explained. The tour was finalized with a walk to the nearby protected, historical, industrial plant “Brede Works”. The tour was guided by Arne Egerup and Niels Mejlhede Jensen, both educated civil engineers from DTU with PhD-degrees in timber structures and hydrodynamics respectively.

Tour to Stevns’ Cliffs and Roskilde Cathedral
Inside at Stevns’ Museum and outdoor at the cliffs participants were told about the unique geologic features of the cliffs and about the utilization of the cliffs for building blocks and as a lime resource. In Højerup Old Church Senior Research Conservator Isabelle Brajer from the National Museum of Denmark gave a talk about conservation principles and the present ongoing restauration of the wall paintings. In Roskilde Cathedral Chief structural architect Ole Højlund guided a tour on peculiarities of the cathedral, and finally Cathedral Organist Finn Ewald and Reinhard Jaud demonstrated the historical organ.

Tour of the DTU Civil Engineering labs
At the tour selected laboratory facilities, instruments and ongoing research projects were presented. In particular the construction materials laboratories, the concrete laboratory for mixing and casting, and the laboratory for large scale structural investigation were shown. The tour was guided by Associate professor Marianne Tange Hasholt.

Figure 17. Left: During a technical tour to the Open-Air Museum Dr. Niels Mejlhede Jensen explains event delegates about the beneficial fire limiting properties of the sea-weed thatched roof at the farmhouse from Læsø. Right: Senior Research Conservator Isabelle Brajer from The National Museum of Denmark tells about restoration and conservation principles of wall paintings in the Højerup Old Church.
Appendices

Folders
  Conference segments
  Doctoral courses

Programs
  Overview timetable
  Conference segments
  Doctoral courses
  RILEM week
Innovation of Teaching in Materials and Structures

Lyngby, Denmark, 21-24 August 2016

Call for papers

Organizing committee
P. Goltermann

Scientific committee
To be announced

Sponsored by
RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

RILEM Week 2016
RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RIEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RIEM Week 2016 (21-24 Aug 2016). The RIEM Week is the highlight of the RIEM calendar each year and includes meetings in many of RIEM’s technical and administrative committees. More information about RIEM can be found at www.rilem.net

Scientific sponsor
RIEM is scientific sponsor of the conference along with the Technical University of Denmark, Department of civil Engineering.

Materials, Systems and Structures in Civil Engineering – MSSCE 2016
In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of Teaching in Materials and Structures
- Reliability, Safety and Value of Information
- Service Life of Cement-based Materials and Structures
- Historical Masonry
- Electrochemistry in Civil Engineering
- Moisture in Materials and Structures
- Concrete with Supplementary Cementious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.
Conference segment contents

Innovation of teaching in the field of materials and structures is one of the most important activities at a technical university. Innovation is as such required to produce better candidates with constantly less resources available at your university, while at the same time accommodate for the changing requirements.

Contributions to the conference segment should deal with experiences and/or plans for the teaching and learning of topics within the fields of materials and structures.

Contributions to the conference segment may be within – but are not limited to – the following topics:

• Novel teaching and learning concepts
• E-learning in theory and in practice
• MOOC courses with local activities
• Blended E-learning
• Experimental activities
• Students labs
• CDIO and innovation activities
• Flipped classroom
• Distance learning
• International courses
• Teaching students with different nationalities
• Teaching students with different mobilities
• Teaching students with different backgrounds
• Teaching students with different experiences
• Teaching students with different mentalities

Participants may have a background as university teachers, university researchers, PhD students, or industry specialists. The conference language is English.

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

<table>
<thead>
<tr>
<th>Deadline</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract due</td>
<td>29th January 2016 (Acceptance of abstract: 8th March 2016)</td>
</tr>
<tr>
<td>Full manuscript due</td>
<td>21st March 2016 (Acceptance of full manuscript: 27th May 2016)</td>
</tr>
<tr>
<td>Final manuscript due</td>
<td>8th July 2016</td>
</tr>
</tbody>
</table>

Abstracts and papers should be submitted through the conference home page: www.conferencemanager.dk/MSSCE2016/call-for-papers.html

Venue and time

The conference will be preceded by a DTU-RILEM Doctoral Course 8-19 August 2016 on different conference topics. The conference segment will be preceded by an event opening in the late afternoon of 21 August and take place 23-24 August 2016, starting with a common conference opening.

The general venue of the event is the Technical University of Denmark, Lyngby campus.

Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016/1-innovation-of-teaching-in-materials-and-structures-conf.html

Further information

Further information can be found at the MSSCE 2016 event website or you may contact the segment responsible:

Per Goltermann
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Teaching@byg.dtu.dk

Registration, price and accommodation

The deadline for conference registration is Friday, 8th July 2016. The conference registration fee includes conference opening, conference dinner, and bus transport. The conference dinner will take place 23-24 August 2016.

Language is English. The conference offers the following sessions:

• Industry speciality
• Course speciality
• University speciality
• International courses
• Distance learning
• Blended E-learning
• MOOC courses
• Experimental activities
• Students labs
• CDIO and innovation activities
• Teaching students with different mobilities
• Teaching students with different backgrounds
• Teaching students with different experiences
• Teaching students with different mentalities
• Teaching students with different nationalities
• Teaching students with different experiences
• Teaching students with different nationalities
• Teaching students with different mobilities
• Teaching students with different experiences
• Teaching students with different mentalities
• Teaching students with different nationalities

For the conference requirements, contact the segment responsible at the Technical University of Denmark, Lyngby campus. In addition to the following regulations, all attendees are required to produce e-receipts of all services provided. In addition to the conference requirements, alcohol and smoking is one of the most important regulations of the conference in the field of materials and structures.
Materials, Systems and Structures in Civil Engineering - MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of teaching in materials and structures
- Reliability, Safety and Value of Information
- Service life of cement-based materials and structures
- Historical masonry
- Electrochemistry in Civil Engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious materials
- Frost action in concrete
- Fresh Concrete
- Clay and Shale
- Cold region engineering
- Building materials and indoor environment
- BIM in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RILEM Week 2016
RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RILEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RILEM Week 2016 (21-24 Aug 2016). The RILEM Week is the highlight of the RILEM calendar each year and includes meetings in many of RILEM’s technical and administrative committees. More information about RILEM can be found at www.rilem.net

Scientific sponsor
RILEM is scientific sponsor of the conference segment through the technical committee JCSS: Joint Committee on Structural Safety. This segment also serves as a dissemination event for the COST Action.

Call for papers
Organizing committee
M. H. Faber, J. D. Sørensen, S. Thøns and A.C.W.M Vrouwenvelder

Scientific committee
Members of the Joint Committee on Structural Safety

Sponsored by
RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

TU1402 “Quantifying the Value of Structural Health Monitoring”.

Materials, Systems and Structures in Civil Engineering - MSSCE 2016
Conference segment on
Reliability, Safety and Value of Information

Lyngby, Denmark, 23 August 2016

Call for papers
Over the past 4-5 decades, the research field of reliability and safety in engineering has progressed significantly and now forms the foundation for most best practices, leading standards, codes and regulations in engineering.

Contemporary challenges associated with the need for sustainable societal developments and mitigation of, and adaptation to, climate change calls for increased efforts on the identification of rational, safe, reliable, and economical engineered solutions.

The conference segment will serve as a platform for sharing new ideas and concepts in the field of risk informed decision making, reliability and safety as well as for setting the direction and focus of future developments.

Contributions should deal with theory, methods, models, and applications within – but not limited to – the following topics:

- Uncertainty modeling of loads and resistances
- Probabilistic modeling of structural response
- Probabilistic modeling of deterioration
- Optimization and service life analyses
- Risk informed decision making
- Value of information analyses
- Probabilistic systems modeling and analysis
- Structural robustness
- Probabilistic modeling of natural hazards
- Life safety, regulation and standardization
- Risk acceptability and risk communication
- Uncertainty modeling of loads and resistances
- Probabilistic modeling of natural hazards
- Life safety, regulation and standardization
- Risk acceptability and risk communication
- Uncertainty modeling of loads and resistances

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

More information can be found at the MSSCE2016 event website.

Technical tours and social activities include an opening and a conference dinner.

Venue and Time:

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place on 23 August 2016, starting with a common conference opening in the late afternoon of 21 August. The conference segment will conclude with a common conference closing.

Registration, price and accommodation:

The deadline for event registration is Friday, 8 July 2016. The conference fee covers participation in the MSSCE2016 conference segment of your choice and includes conference proceedings, refreshments, lunches, conference opening, conference dinner, and bus transport to and from the event location.

- Regular participant: EUR 550
- PhD students: EUR 400

Pre-bookings of rooms have been made at hotels in central Copenhagen; however, participants need to make their own accommodation arrangements at their own expense. Pre-bookings of rooms have been made at hotels in central Copenhagen; however, participants need to make their own accommodation arrangements at their own expense.

Further information can be found at the MSSCE2016 event website; or you may contact the segment responsible:

Michael H. Faber
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Reliability@byg.dtu.dk

Registration, price and accommodation:

The deadline for event registration is Friday, 8 July 2016. The conference fee covers participation in the MSSCE2016 conference segment of your choice and includes conference proceedings, refreshments, lunches, conference opening, conference dinner, and bus transport to and from the event location.

- Regular participant: EUR 550
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Michael H. Faber
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Reliability@byg.dtu.dk

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Materials, Systems and Structures in Civil Engineering - MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of teaching in materials and structures
- Reliability and safety
- Value of information in structural health monitoring
- Service life of cement-based materials and structures
- Historical masonry
- Wood science
- Electrochemistry in civil engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious mater.
- Frost action in concrete
- Sim. tools in the execution phase of concr. struct.
- Biobased building materials
- Soils, rocks and geotechnical engineering
- Cold region engineering
- Building materials and indoor environment
- BIM in civil engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

RI LEM Week 2016
RI LEM is the international union of laboratories and experts in construction materials, systems, and structures. RI LEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RI LEM Week 2016 (21-24 Aug 2016). The RI LEM Week is the highlight of the RI LEM calendar each year and includes meetings in many of RI LEM’s technical and administrative committees. More information about RI LEM can be found at www.rilem.net

Scientific sponsor
COST action TU1404 “Towards the next generation of standards for service life of cement-based materials and structures” is scientific sponsor of the conference segment. COST action TU1404 starts its activities in 2014 and has more than 20 participating countries, cf. http://www.cost.eu/COST_Actions/tud/Actions/TU1404

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RI LEM Week 2016
Conference segment on
Service life of cement-based materials and structures
Lyngby, Denmark, 21-24 August 2016

Call for papers

Organizing committee
Miguel Azenha, TBD, O.M. Jensen

Scientific committee
Management Committee of COST action TU1404

Sponsored by
COST action TU1404, RI LEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Conference segment contents

The main objective of COST Action TU1404 is to bring together researchers and practitioners in the pursuit of knowledge integration for better understanding of the service life of cement based materials and structures. This conference segment is dedicated to the discussion and dissemination of relevant results of Action members, but also from any researcher or practitioner reporting work related to the Workgroups and Group Priorities of the Action.

WG1 - Testing of CBM
GP1a - Fresh properties and setting
GP1b - Chemical / microstructural characterization
GP1c - Transport properties and boundary effects
GP1d - Mechanical properties (including creep)
GP1e - Volume stability
GP1f - Fracture properties and cracking

WG2 - Modeling of CBM and behavior of structures
GP2a - Multi-scale models
GP2b - Multi-physics macroscopic modelling
GP2c - Modelling assumptions

WG3 - Development of products and recommendations
GP3a - Product development for testing/monitoring
GP3b - Product development for software
GP3c - Reliability considerations
GP3d - Recommendations, pre-standard documents

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

Publication dates

Submission for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstract due: 8 January 2016 (Acceptance of abstract: 29 January 2016)
- Full manuscript due: 21 March 2016 (Acceptance of full manuscript: 27 May 2016)
- Final manuscript due: 8 July 2016

Abstracts should be submitted through the conference home page.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016, starting with a common conference opening in the late afternoon of 21 August 2016.

The conference segment will be preceded by a DTU-RILEM Doctoral Course 15-19 August 2016 on the same topic as the conference segment.

Technical tours and social activities

Tours are planned to take place on 20-21 August. The tours will involve places of technical interest inside and outside the greater Copenhagen area. The social activities during the conference will include a conference opening reception, a guided Copenhagen city tour, and a conference dinner in downtown Copenhagen.

Further information

Further information can be found at the conference home page.

Registration, costs and accommodation

Participants should register before 8 July 2016 through the conference home page. The conference fee covers participation in the conference part and technical tours of MSSCE 2016 and includes conference proceedings, refreshments, lunches, opening reception, conference dinner and bus transport.

- Delegates: EUR 600
- PhD students: EUR 400
- Delegates: EUR 600

Arrangements are made with hotels in central Copenhagen. Bus transport between the hotels and the event location will be provided.

Venue and time

8 July 2016
Full manuscript due: 21 March 2016
Abstract due: 8 January 2016
Materials, Systems and Structures in Civil Engineering - MSSCE 2016

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- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
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Materials, Systems and Structures in Civil Engineering - MSSCE 2016

Conference segment on

Historical Masonry

Lyngby, Denmark, 21-24 August 2016

Call for papers

Organizing committee
I. Rörig-Dalgaard, I. Ioannou

Scientific committee
Maria Stefanidou
Daniel V. Oliveira
Hilde De Clercq
A. Elena Charola
Muzahim Al-Mukhtar

Sponsored by
RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Lime- and Brickworks association, Denmark
Director Ib Henriksens Foundation, Denmark

KALK- OG TEGLVERKSFØRENINGEN
DIREKTØR IB HENRIKSENS FOND

DTU
A significant part of historical structures are erected in masonry. The long service life of historical masonry stipulates special demands on durability, repair and conservation issues. This conference segment will serve as a platform for dissemination of state-of-the-art knowledge and will create a forum for knowledge transfer within historical masonry.

Contributions to the conference segment should deal with theory, modelling, or results from experimental investigations with relation to historical masonry and may fall within – but are not limited to – the following topics:

- Characterization of Masonry Materials
- Reproduction of Traditional Composites
- Optimization of Masonry Composite Materials
- Strength and Durability
- Measurement Techniques
- Mechanisms of Masonry Decay
- Damage analysis and assessments
- Repair, Restoration and Conservation
- Replication of Masonry Composite Materials
- Conservation of Traditional Composites
- Characterization of Masonry Materials

Participants may have a background as university researchers, PhD students, scientists at national institutes and industry specialists. The conference language is English.

Publication dates
Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstract due: 8 July 2016 (Acceptance of full manuscript: 27 May 2016)
- Full manuscript due: 22 April 2016 (Acceptance of full manuscript: 27 May 2016)
In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

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- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at [www.conferencemanager.dk/MSSCE2016](http://www.conferencemanager.dk/MSSCE2016)

### RILEM Week 2016

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### Scientific sponsor

RILEM is scientific sponsor of the conference along with the Technical University of Denmark, Department of civil Engineering.

### Call for papers

**Organizing committee**

Lisbeth M. Ottosen

**Sponsored by**

RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.
Electrochemistry is the discipline of chemical reactions taking place at the interface of an electrode and an ionic conductor including the electric charges moving between the electrodes. Electrochemistry is important to different branches within civil engineering, and this includes both the unintended reactions as reinforcement corrosion and the intended reactions driving electro-desalination of construction materials.

This conference segment emphasize the application of electrochemistry to technological development as well as testing and fundamental understanding within civil engineering.

Contributions to the conference segment may be within – but are not limited to:

- Reinforcement corrosion
  - Corrosion mechanisms and propagation
  - Modeling of service life
- Electrochemical repair techniques
  - Cathodic protection
  - Electrochemical chloride extraction
  - Realkalisation
  - Electro-desalination for heritage conservation
- Electrochemical methods
  - Electrical resistivity as non-destructive test
  - Impedance spectroscopy
- Electrokinetics in geotechnical engineering
  - Electroosmotic dewatering

Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016/electrochemistry-in-civil-engineering.html - or you may contact the segment responsible:

Lisbeth M. Ottosen
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Electrochemistry@byg.dtu.dk

Publication dates
Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

Abstracts due: 29th January 2016
Full manuscripts due: 21st April 2016
(acceptance of full manuscripts: 27th May 2016)
(acceptance of abstracts: 4th March 2016)

Conference segment contents
A conference dinner including a conference opening reception and social activities during the conference will take place at the greater Copenhagen area. The technical and social events include field trips and social events during the conference. The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will be preceded by a DTU-RILEM Doctoral Course 8-19 August 2016.

Venue and Time

For paper submission:
www.conferencemanager.dk/MSSCE2016/call-for-papers.html

www.conferencemanager.dk/MSSCE2016/july2016

registration, price and accommodation
Registration, price and accommodation information can be found at the MSSCE 2016 event website. Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016/call-for-papers.html - or you may contact the segment responsible:

Lisbeth M. Ottosen
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Electrochemistry@byg.dtu.dk

Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016/electrochemistry-in-civil-engineering.html - or you may contact the segment responsible:

Lisbeth M. Ottosen
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Electrochemistry@byg.dtu.dk
Materials, Systems and Structures in Civil Engineering – MSSCE 2016

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- Concrete with Supplementary Cementitious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RI LEM Week 2016
RI LEM is the international union of laboratories and experts in construction materials, systems, and structures. RI LEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RI LEM Week 2016 (21-24 Aug 2016). The RI LEM Week is the highlight of the RI LEM calendar each year and includes meetings in many of RI LEM's technical and administrative committees. More information about RI LEM can be found at www.rilem.net

Scientific sponsor
RI LEM is scientific sponsor of the conference segment through the technical committee TC 248-MMB: Methods of Measuring Moisture in Building Materials and Structures. TC 248-MMB started activities in 2012 and has about 30 members from all over the world.

Lyngby, Denmark, 21st-24th August 2016

Call for papers

Organizing committee
K. Kielsgaard Hansen, L.-O. Nilsson, C. Rode

Scientific committee
Members of RI LEM TC 248-MMB

Sponsored by
RI LEM TC 248-MMB
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Moisture Research Centre, Lund, Sweden
International Association of Building Physics
IDA Building Physics, Denmark
IDA Materials, Denmark
SINTEF Byggforsk, Norway
Properties and performance of building materials and structures are to a large extent influenced by the moisture conditions in the materials. Obvious examples are thermal conductivity, shrinkage and creep, transport properties, discolouration, emissions to indoor air, most types of deterioration and service-life. Prediction and measurements methods are essential and must be based on a thorough understanding of moisture and quantified material properties and boundary conditions. The conference segment will serve as a platform for dissemination of state-of-the-art knowledge.

Contributions to the conference segment should deal with theory, modelling or results from experimental investigations with relation to moisture in materials and structures. Contributions to the conference segment may be within – but are not limited to – the following topics:

- Pore structure and moisture properties
- Properties of materials and structures
- Experimental methods and results
- Methods and methodology for moisture measurements in materials and structures
- Boundary conditions
- Prediction models
- Hysteresis and scanning behaviour
- Consequences of moisture
- The role of moisture in deterioration
- Coupled transport phenomena

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

Registration, price and accommodation

The deadline for conference registration is Friday, 8th July 2016 through the conference website. Further information can be found at the MSSCE2016 event website; www.conferencemanager.dk/MSSCE2016-
moisture-in-materials-and-structures-conf.html or you may contact the segment responsible:

Kurt Kielsgaard Hansen
Department of Civil Engineering
Technical University of Denmark
Kgs. Lyngby
Tel.: 44397670
E-mail: MSSCE2016.Moisture@byg.dtu.dk

The conference fee covers participation in the MSSCE 2016 conference segment of your choice and includes conference proceedings, refreshments, lunches, conference opening, conference dinner and bus transport, option to present at the registered segment:

- Regular participant: EUR 550
- PhD students: EUR 400

Pre-bookings of rooms have been made at hotels in central Copenhagen, however, participants need to make their own accommodation arrangements at these or other hotels. Bus transport between the suggested hotels and the event location will be provided.

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstract due: 29th January 2016 (Acceptance of abstract: 8th March 2016)
- Full manuscript due: 21st March 2016 (Acceptance of full manuscript: 27th May 2016)

Ethical and legal requirements for authors

Abstracts and papers should be submitted through the conference home page: www.conferencemanager.dk/MSSCE2016/call-for-papers.html

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 23-24 August 2016, starting with a common conference opening on 21 August. The conference segment will be preceded by a DTU-RILEM Doctoral Course 8-19 August 2016 on different conference topics.

Technical tours and social activities

Tours are planned to take place on 22nd and 25th August. The tours will involve visits of technical interest inside and outside the greater Copenhagen area. The tours are planned to take place at 2pm.

Technical tours and social activities include:

- A conference dinner
- A conference opening reception and social activities during the conference will be preceded by a common conference opening. The conference segment will serve as a platform for dissemination of state-of-the-art knowledge. Contributions to the conference segment will be preceded by a common conference opening. The conference segment will take place on 23rd and 24th August and include a conference dinner.

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstract due: 29th January 2016 (Acceptance of abstract: 8th March 2016)
- Full manuscript due: 21st March 2016 (Acceptance of full manuscript: 27th May 2016)

Further information

Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016-
moisture-in-materials-and-structures-conf.html or you may contact the segment responsible:

Kurt Kielsgaard Hansen
Department of Civil Engineering
Technical University of Denmark
Kgs. Lyngby
Tel.: 44397670
E-mail: MSSCE2016.Moisture@byg.dtu.dk

 Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The conference segment will take place at 2pm.

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Further information

Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016-
moisture-in-materials-and-structures-conf.html or you may contact the segment responsible:

Kurt Kielsgaard Hansen
Department of Civil Engineering
Technical University of Denmark
Kgs. Lyngby
Tel.: 44397670
E-mail: MSSCE2016.Moisture@byg.dtu.dk

Publication dates

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- Abstract due: 29th January 2016 (Acceptance of abstract: 8th March 2016)
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Further information

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moisture-in-materials-and-structures-conf.html or you may contact the segment responsible:

Kurt Kielsgaard Hansen
Department of Civil Engineering
Technical University of Denmark
Kgs. Lyngby
Tel.: 44397670
E-mail: MSSCE2016.Moisture@byg.dtu.dk

The conference language is English.
Materials, Systems and Structures in Civil Engineering – MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of Teaching in Materials and Structures
- Reliability, Safety and Value of Information
- Service Life of Cement-based Materials and Structures
- Historical Masonry
- Electrochemistry in Civil Engineering
- Moisture in Materials and Structures
- Concrete with Supplementary Cementitious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RI LEM Week 2016
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Scientific sponsor
RI LEM is scientific sponsor of the conference segment through the technical committee TC 238-SCM: Hydration and microstructure of concrete with supplementary cementitious materials. TC 238-SCM started activities in 2011 and has about 50 members from all over the world.

Organizing committee
N. de Belie, K. Kovler, O.M. Jensen

Scientific committee
Members of RI LEM TC 238-SCM

Sponsored by
RI LEM TC 238-SCM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Hydraulic and pozzolanic industrial by-products, natural resources and societal waste are increasingly being used as valuable, supplementary cementitious materials (SCMs) in concrete. Materials such as fly ash, blastfurnace slag, silica fume, calcined clay and limestone are important to obtain concrete with improved and targeted properties and not the least to make the construction industry more sustainable and less CO₂-intensive. The conference segment will serve as a platform for dissemination of state-of-the-art knowledge.

Contributions to the conference segment should deal with theory, modeling, or results from experimental investigations with relation to the use of SCMs in concrete. Contributions to the conference segment may be within – but are not limited to – the following topics:

- Characterization of SCMs
- SCM reactivity in blended cements
- Cement-SCM interaction
- SCM-admixture interaction
- Hydration products
- Pore solution composition
- Effect of SCM on fresh concrete
- Hardened concrete with SCM
- SCM influence on microstructure
- Durability of concrete with SCM
- SCM influence on microstructure
- Hardened concrete with SCM
- Effect of SCM on fresh concrete
- Hydration products
- SCM admixture interaction
- Cement-SCM interaction
- SCM reacting in blended cements
- SCM influence on microstructure
- Durability of concrete with SCM
- SCM influence on microstructure
- Hardened concrete with SCM
- Effect of SCM on fresh concrete
- Hydration products
- SCM admixture interaction
- Cement-SCM interaction
- SCM reacting in blended cements
- SCM influence on microstructure
- Durability of concrete with SCM

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

Registration, price and accommodation

The deadline for conference registration is Friday, 8th July 2016 through the conference website. The conference fee covers participation in the MSSCE 2016 conference segment of your choice and includes conference proceedings, refreshments, lunches, conference opening, conference dinner and bus transport. The general rules of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The general venue of the event is the Technical University of Denmark, Lyngby campus. The general rules of the event is the Technical University of Denmark, Lyngby campus.

Venue and Time

For more information:
www.conferencemanager.dk/MSSCE2016/scm

Further information can be found at the MSSCE 2016 event website:
www.conferencemanager.dk/MSSCE2016/7concrete-with-scm---conference.html

- or you may contact the segment responsible:

Ole Mejlhede Jensen
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.SCM@byg.dtu.dk

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstracts due: 8th July 2016
- Full manuscripts due: 27th March 2016
- Call for papers: 8th March 2016

Further information can be found at the MSSCE 2016 event website:
www.conferencemanager.dk/MSSCE2016/call-for-papers.html

The general rules of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August.

Further details for technical tours and social activities are available on the conference website. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The conference segment will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August.

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Materials, Systems and Structures in Civil Engineering - MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of Teaching in Materials and Structures
- Reliability, Safety and Value of Information
- Service Life of Cement-based Materials and Structures
- Historical Masonry
- Electrochemistry in Civil Engineering
- Moisture in Materials and Structures
- Concrete with Supplementary Cementitious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

RI LEM Week 2016

RI LEM is the international union of laboratories and experts in construction materials, systems, and structures. RI LEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RI LEM Week 2016 (21-24 August 2016). The RI LEM Week is the highlight of the RI LEM calendar each year and includes meetings in many of RI LEM’s technical and administrative committees. More information about RI LEM can be found at www.rilem.net

Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nøi s en foundation is financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

Organizing committee

Marianne Tange Hasholt, Katja Fridh

Scientific committee

R. Doug Hooton, Katja Fridh, Marianne Tange Hasholt

Sponsored by

RI LEM
Knud Højgaard Foundation, Denmark
Larsen & Nøl sen Foundation, Denmark
Frost deterioration is an aesthetical problem, but the durability aspect is even more important, as this can jeopardise the structural integrity of buildings, infrastructures, etc. Despite research in this field has been ongoing since the 1930's, the mechanism(s) leading to frost damage is still not fully understood. There is still a need for both basic research and practical solutions to the challenges encountered.

The conference segment will take place 23-24 August 2016. The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference opening will take place 23-24 August 2016, starting with a common conference opening in the late afternoon of 21 August. The tours will involve places of technical and societal interest inside and outside the greater Copenhagen area. The conference fee covers both participation in the MSSCE 2016 segment i.e. Frost action in Concrete in addition to admission to the other conference segments (22-24 August). It includes conference proceedings, option to present at the registered segment, refreshments, lunches, conference opening, conference dinner and bus transport between the suggested hotels and the venue.

Venue and time

Full manuscript due: 8th January 2016
Abstract due: 29th March 2016
Deadlines for all manuscripts: 22-24 August 2016
(Acceptance of full manuscripts: 27th March 2016)
Final manuscript due: 8th July 2016
(Acceptance of full manuscripts: 27th July 2016)
Abstract due: 29th March 2016

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

For experimental papers:
8th January 2016
29th March 2016
8th July 2016

For papers/pitch:

For papers/pitch:
www.conferencemanager.dk/MSSCE2016/call-for-papers.html
www.conferencemanager.dk/MSSCE2016/registration/price.html
www.conferencemanager.dk/MSSCE2016/registration/accommodation.html

Registration, price and accommodation

Pre-bookings of rooms have been made at hotels in central Copenhagen. However, participants need to make their own accommodation arrangements at these or other hotels. Further information can be found at the MSSCE 2016 event website; www.conferencemanager.dk/MSSCE2016/8-frost-act-in-concrete-conf.html - or you may contact the segment responsible:
Marianne Tange Hasholt
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.Frost@byg.dtu.dk
Materials, Systems and Structures in Civil Engineering - MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of teaching in materials and structures
- Reliability, Safety and Value of Information
- Service life of cement-based materials
- Historical masonry
- Electrochemistry in civil engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious mater.
- Frost action in concrete
- Fresh concrete
- Clay and Shale
- Cold region engineering
- Building materials and indoor environment
- BIM in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

RI LEM Week 2016

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Scientific sponsor

RILEM is scientific sponsor of the conference along with the Technical University of Denmark, Department of Civil Engineering.

Organizing committee

L. N. Thrane, C. Pade, O. Svec, N. Roussel

Scientific committee


Sponsored by

RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Knowledge and understanding of the fresh concrete properties, the casting process and the development in early age properties of concrete can contribute to improved design, execution planning and quality control ultimately resulting in higher quality of the final concrete structure. For instance, numerical, analytical and empirical based simulation tools are increasingly being used as a valuable supplementary tool in the execution phase of concrete structures and serve as an efficient means towards achieving environmentally friendly and cost effective concrete structures. The conference segment will serve as a platform for dissemination of state-of-the-art knowledge.

Contributions to the conference segment may be within – but are not limited to – the following topics:

- Mix design
- Constituent materials
- Flow of fresh concrete
- Rheology of fresh concrete
- Segregation of aggregate
- Formwork pressure
- Thixotropy
- Fiber distribution
- Fiber orientation
- Quality control
- Temperature development
- Stress development

Participants may have a background as university researchers, PhD students, or industry specialists. The conference language is English.

Further information can be found at the home page or by contacting the segment responsible.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016. The conference segment will be preceded by several DTU-RILEM Doctoral Courses 15-19 August 2016 starting with a common course.

Registration, costs and accommodation

The deadline for event registration is Friday, 8th July 2016 through the conference website. The conference fee covers both participation in the MSSCE 2016 segment i.e. Fresh Concrete in addition to admission to the registered segment, refreshments, conference proceedings, option to present at the conference segment, inclusion of paper in the conference proceedings, and inclusion in conference proceedings. The conference segment will take place 21-24 August 2016 in the Danish Technological Institute.

Publication dates

Abstract due: 27 May 2016
(acceptance of all manuscripts: 29 January 2016)
Full manuscript due: 21 April 2016
(acceptance of all manuscripts: 24 January 2016)
Full manuscript due: 8 June 2016

Conference segment contents

Technical tours and social activities

A visit to the concrete lab at the Danish Technological Institute will include a visit to the concrete lab at the conference segment. This segment will include a visit to the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016. All sessions will take place at the Danish Technological Institute in Lyngby, just outside Copenhagen.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016.

Registration, costs and accommodation

The deadline for event registration is Friday, 8th July 2016 through the conference website. The conference fee covers both participation in the MSSCE 2016 segment i.e. Fresh Concrete in addition to admission to the registered segment, refreshments, conference proceedings, option to present at the registered segment, lunches, conference opening, conference dinner and bus transport.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016.

Registration, costs and accommodation

The deadline for event registration is Friday, 8th July 2016 through the conference website. The conference fee covers both participation in the MSSCE 2016 segment i.e. Fresh Concrete in addition to admission to the registered segment, refreshments, conference proceedings, option to present at the registered segment, lunches, conference opening, conference dinner and bus transport.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016.

Registration, costs and accommodation

The deadline for event registration is Friday, 8th July 2016 through the conference website. The conference fee covers both participation in the MSSCE 2016 segment i.e. Fresh Concrete in addition to admission to the registered segment, refreshments, conference proceedings, option to present at the registered segment, lunches, conference opening, conference dinner and bus transport.

Venue and Time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference segment will take place 21-24 August 2016.
Materials, Systems and Structures in Civil Engineering - MSSCE 2016

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- Moisture in materials and structures
- Concrete with supplementary cementitious mater.
- Frost action in concrete
- Fresh Concrete
- Clay and Shale
- Cold Region engineering
- Building materials and indoor environment
- BIM in civil engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RILEM Week 2016
RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RILEM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RILEM Week 2016 (21-24 Aug 2016). The RILEM Week is the highlight of the RIEM calendar each year and includes meetings in many of RIEM’s technical and administrative committees. More information about RIEM can be found at www.rilem.net

Scientific sponsor
RILEM is scientific sponsor of the conference along with the Technical University of Denmark, Department of civil Engineering.

Cold Region Engineering
Lyngby, Denmark, 23-24 August 2016

Call for papers

Organizing committee
Lisbeth M. Ottosen
Thomas Ingeman-Nielsen,
Tove Lading
ARTEK – Arctic Technology Center, DTU Byg

Sponsored by
RILEM
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

ARCTIC TECHNOLOGY CENTRE
Workshop contents

The overall topic of this workshop is research and practical experiences in cold regions engineering. Cold regions are part of the earth system characterized by the presence of snow and ice at least part of the year and include both polar and sub-polar regions. Such harsh climate strongly affects construction and building and construction technologies to be used in cold environments, especially in coastal and marine environments. The workshop will cover participation in the MSSC2016 website.

The general venue of the event is the Technical University of Denmark, Lyngby campus. The conference workshop will take place 23-24 August 2016.

Venue and Time

Dates

Workshop participants: EUR 150

Further Information

Call-for-papers.html

MSC2016.Cold@byg.dtu.dk

Conference Manager: Lisbeth M. Ottosen

Further information can be found at the MSSC2016 website: http://www.confman.dtu.dk/MSSC2016/Cold-Regions-Engineering-conference-manager.html

Venue and Time

8-9 July 2016

Abstract deadline: 27 May 2016

Full manuscript deadline: 31 May 2016

Acceptance of full manuscripts: 27 May 2016

24-25 March 2016

Acceptance of abstracts: 8 March 2016

29/30 January 2016

Abstract: EUR 550 With option to participate in full conference registration.

Dates

Workshop contents

- Arctic coastal and marine structures
- Durability of construction materials in cold climate
- Indoor environment highlighting both energy consumption and renovation of residences in cold climate
- Physical constraints for climate adaptation
- Buildings designed specifically for cold climate
- Innovative approaches to adapt conventional building and construction technologies to cope with the cold climate
- Climatic effects on mechanical properties of snow, ice, soil and rock
- Buildings designed specifically for cold climate
- Special issues on environmental and practical experiences in cold regions
Materials, Systems and Structures in Civil Engineering – MSSCE 2016

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- Concrete with Supplementary Cementitious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

RILEM Week 2016

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Scientific sponsor

RILEM is scientific sponsor of the conference along with the Technical University of Denmark, Department of civil Engineering.

Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RILEM Week 2016

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Scientific sponsor

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Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.
The conference segment will focus on the potential for, and challenges in, adopting open data standards in civil engineering. For decades, the civil engineering domain has been a frontrunner in adopting IT not only for design tasks but also for subsequent production on site with machine guidance. However, the industry still faces challenges in sharing and integrating digital data from different sources during the lifecycle of the facilities.

Several research and development initiatives have been started at the global, regional and national levels to try to overcome the challenges. The issues to be addressed include a lack of semantic consensus, incompatible data models, the need for geo referencing, the management of data from different data sources, access rights, information delivery specifications and legislation.

As it becomes more common to use or mandate delivery of data in open format there is an increasing demand for knowledge on open BIM in the construction industry. The conference will focus on open data standards and especially training and educational initiatives in open standards at architectural and civil education levels. All the participants are encouraged to present and share educational materials at the conference and subsequent educational and training sessions and events.

The conference will take place 23-24 August 2016, starting with a common conference opening at Lyngby Campus. The conference segment will take place 23-24 August 2016, starting with a common conference opening at Lyngby Campus. The conference will be preceded by a DTU-RILEM Doctoral Course 8-19 August 2016.

The conference segment will focus on technical and social activities.

Technical tours and social activities

25th August. The tours will involve places of technical and educational interest inside and outside the greater Copenhagen area. The technical and social activities during the conference will be recorded and published.

Registration and accommodation

The conference will focus on open BIM in the construction industry.

As it becomes more common to use or mandate delivery of data in open format there is an increasing demand for knowledge on open BIM in the construction industry.

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Materials, Systems and Structures in Civil Engineering - MSSCE 2016
In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The conference segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of Teaching in Materials and Structures
- Reliability, Safety and Value of Information
- Service Life of Cement-based Materials and Structures
- Historical Masonry
- Electrochemistry in Civil Engineering
- Moisture in Materials and Structures
- Concrete with Supplementary Cementious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

RIELM Week 2016
RIELM is the international union of laboratories and experts in construction materials, systems, and structures. RIELM has the aim to promote scientific cooperation. The event described in this folder runs in conjunction with the Annual RIELM Week 2016 (21-24 Aug 2016). The RIELM Week is the highlight of the RIELM calendar each year and includes meetings in many of RIELM's technical and administrative committees. More information about RIELM can be found at www.rilem.net

Scientific sponsor
RIELM is scientific sponsor of the overall conference. This segment of the conference will partly be sponsored by the International Centre for Indoor Environment and Energy (ICIE.DTU), Danish Institute of Technology (DTI), Danish Building Research Institute (SBi.AAU) and COST Action TU1301, NORM for Building materials

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RIELM Week 2016
Building Materials and Indoor Environment
Lyngby, Denmark, 21st-24th August 2016

Call for papers

Organizing committee
Pawel Wargocki, Lisbeth Ottesen, Bjarne W. Olesen, Technical University of Denmark
Thomas Witterseh, Danish Institute of Technology
Lars Gunnarsen, Danish Building Research Institute (SBi), Aalborg University

Scientific committee
To be announced

Sponsored by
COST Action TU1301
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Conference segment contents

Building materials have a significant influence on the indoor environmental quality. Emissions from materials will influence the indoor air quality and the requirements for ventilation. Other indoor environmental parameters like acoustic and lighting conditions are influenced by the surface materials used. The conference segment will serve as a platform for dissemination of state-of-the-art knowledge.

Publication dates

Submissions for conference presentation and publication in reviewed proceedings need to adhere to the following deadlines:

- Abstract due: 8th May 2016
- Full manuscript due: 27th January 2016
- Final manuscript due: 8th July 2016

Technical tours and social activities

The conference segment will take place 23-24 August. The tour will involve visits of buildings outside the greater Copenhagen area. The technical and social tour will be preceded by a conference opening on 21 August. The conference segment will take place 23-24 August, starting with a common conference opening. The general venue of the event is the Technical University of Denmark, Lyngby Campus. The conference segment will precede by a DTU-RILEM Doctoral Course 8-19 August 2016 on different conference topics.

Venue and time

The conference segment will be preceded by a conference opening on 21 August. The conference segment will take place 23-24 August, starting with a common conference opening. The general venue of the event is the Technical University of Denmark, Lyngby Campus. The conference segment will be preceded by a DTU-RILEM Doctoral Course 8-19 August 2016 on different conference topics.

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Registration, price and accommodation

The deadline for conference registration is Friday, 8th July 2016 through the conference website. The conference fee covers participation in the conference segment of your choice and includes accommodation at the conference hotel. Pre-bookings have been made at different hotels in central Copenhagen. However, participants need to make their own accommodation arrangements at those or other hotels. Bus transport will be provided to and from the conference hotel.

Further information

The conference segment will serve as a platform for dissemination of state-of-the-art knowledge. Contributions to the conference segment may be within – but are not limited to – the following topics:

- Emissions from materials
- Indoor climate Testing of materials
- Test standards
- Dynamic calculations of material emissions
- Indoor climate Testing of materials
- Emissions from materials
- Acoustic
- Lighting
- Air Cleaning Materials

Conference segment contents

Conference segment contents

Conference segment contents
Materials, Systems and Structures in Civil Engineering – MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The doctoral course segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

• Innovation of Teaching in Materials and Structures
• Reliability, Safety and Value of Information
• Service Life of Cement-based Mat. and Structures
• Historical Masonry
• Electrochemistry in Civil Engineering
• Moisture in Materials and Structures
• Concrete with Supplementary Cementitious Mat.
• Frost Action in Concrete
• Fresh Concrete
• Clay and Shale
• Cold Region Engineering
• Building Materials and Indoor Environment
• Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
COST TU1404, the Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the sponsors includes promotion of research, development and teaching within the construction area.

RI LEM Week 2016

RI LEM is the international union of laboratories and experts in construction materials, systems, and structures. RI LEM has the aim to promote scientific cooperation. The event described in this folder relates to the Annual RI LEM Week 2016 (21-24 Aug 2016). The RI LEM Week is the highlight of the RI LEM calendar each year and includes meetings in many of RI LEM’s technical and administrative committees. More information about RI LEM can be found at www.rilem.net

Scientific sponsor
COST action TU1404 “Towards the next generation of standards for service life of cement-based materials and structures” and RI LEM are the scientific sponsors of the doctoral course segment. All doctoral students registered in the course are offered a 3-year free RI LEM membership.

Materials, Systems and Structures in Civil Engineering – MSSCE 2016

Doctoral course segment on

Service life of Cement-based Materials and structures

Lyngby, Denmark, 15-19 August 2016

Organizers
O.M. Jensen, K. Kovler, S. Staquet, M. Azenha

Teachers
S. Staquet, M. Azenha, O.M. Jensen, K. Kovler, D. Schlicke, B. Delsaute, J. Granja

Sponsored by
COST Action TC1404, RI LEM EAC
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Ingeborg og Leo Dannins Legat for videnskabelig forskning
Scope of doctoral course segment

Service life of cement-based materials is a topic of substantial importance since the maintenance of concrete structures every year necessitate massive investments in rehabilitation and repair. However, constantly ongoing research refines our theoretical knowledge about why deterioration takes place, models for prediction of deterioration are improved, and new measures to prevent deterioration processes appear and extend the service life of concrete structures. This course brings you up-to-date on this important area.

The program of the doctoral course has intricate connections with the objectives of TU1404, with particular emphasis on subjects related to Workgroup 1 'Testing of cement-based materials and RRT+' (cf. www.tu1404.eu).

Course contents

The course will cover important topics related to service life of cement-based materials and structures with a focus on advanced experimental testing methods in the framework of RRT+. The course consists of lectures including also two hands-on laboratory sessions with the application of six advanced experimental testing techniques, two exercise sessions dedicated to numerical simulations and comparisons with experimental data. All the necessary notes will be provided before the course.

Participants

Participants will be responsible for travel, meals, and accommodation. Further information on available grants and financial support - Grants can be found in thehomepage of the course. The course will cover important topics related to the service life of cement-based materials and structures with a focus on advanced experimental testing methods in the framework of RRT+.

Workload, evaluation and certificates

The total workload is approximately 140 hours corresponding to 5 ECTS credits, including the preparation of a poster presentation at the start of the course, and the oral presentation at the end of the course. Certificates will be issued based on active participation in the entire course and the final evaluation.

Participants are expected to have a basic knowledge of concrete technology. The level and form of the course are aimed at doctoral students, but both final year master students and PhD students are admitted at doctoral level. The level of knowledge of concrete technology, the level of participants are expected to have a basic knowledge of concrete technology.

Further information

Further information on available grants and contacts can be found in the homepages of the main event and of the COST Action TU1404: www.conferencemanager.dk/MSSCE2016 and www.tu1404.eu.

Registration, price and accommodation

The deadline for registration is Friday, 8th July 2016 through the conference website. A course fee of EUR 250 applies for the entire course. The registration fee includes entrance to the lectures and associated laboratory activities, a technical tour, conference dinner, and trip to the conference location. The course fee also includes entrance to the lectures and associated laboratory activities, a technical tour, conference dinner, and trip to the conference location.

Participating institutions

This course brings you up-to-date on this important area. This course brings you up-to-date on this important area. This course brings you up-to-date on this important area. This course brings you up-to-date on this important area. This course brings you up-to-date on this important area.

Financial support - Grants

COST Action TU1404 will predictably offer 20 grants of 650€ to support the fee of the Doctoral Training School as well as travelling and lodging expenses. All interested candidates should check the application procedure that will be available in the homepage of the course.

Registration, price and accommodation

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Materials, Systems and Structures in Civil Engineering - MSSCE 2016

In the period 15-29 August a number of doctoral courses and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The doctoral course segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of Teaching in Materials and Structures
- Reliability, Safety and Value of Information
- Service Life of Cement-based Materials and Structures
- Historical Masonry
- Electrochemistry in Civil Engineering
- Moisture in Materials and Structures
- Concrete with Supplementary Cementitious Materials
- Frost Action in Concrete
- Fresh Concrete
- Clay and Shale
- Cold Region Engineering
- Building Materials and Indoor Environment
- Building Information Modelling in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RILEM Week 2016

RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RIEm has the aim to promote scientific cooperation. The event described in this folder relates to the Annual RIEm Week 2016 (21-24 Aug. 2016). The RIEm Week is the highlight of the RIEm calendar each year and includes meetings in many of RIEm's technical and administrative committees. More information about RIEm can be found at www.rilem.net

Scientific sponsor

RIEm is the main scientific sponsor of the doctoral course segment through the RIEm Educational Activities Committee, EAC. Since its formation in 2006 RIEm EAC has sponsored about 100 high-level courses all over the world. All doctoral students registered in the course are offered a 3-year free RIEm membership.

Additional scientific sponsors are:

- RIEm TC-248-MMB on Methods of Measuring Moisture in Building Materials and Structures,
- IABP, International Association of Building Physics,
- Department of Civil Engineering, Technical University of Denmark,
- Moisture Research Centre, Lund University.

Lyngby, Denmark, 15-19 & 25-29 August 2016

Organizers

K. Kielsgaard Hansen, L.-O. Nilsson, C. Rode

Instructors

Kurt Kielsgaard Hansen
Lars-Olof Nilsson
Carsten Rode
plus
External Instructors to be decided

Sponsored by

RIEm EAC

Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Moisture Research Centre, Lund, Sweden
Scope of doctoral course segment

Properties and performance of building materials and structures are to a large extent influenced by the moisture conditions in the materials. Prediction and measurement methods are essential and must be based on a thorough understanding of moisture theory, quantified material properties and boundary conditions. The doctoral course segment will bring you up to date on this important area.

Course contents

The course will cover the most important topics in relation to moisture in materials and structures including:

- Thermodynamics of moisture
- Moisture fixation in materials
- Moisture transport in materials and structures
- Experimental methods
- Moisture measuring methods
- Prediction methods
- Field applications
- Moisture transport in materials and structures
- Predictive transport phenomena
- Experimental methods
- Moisture transporting methods
- Moisture transport in materials and structures
- Predictive transport phenomena
- Experimental methods
- Moisture transport in materials and structures

The course consists of lectures, written exercises and hands-on laboratory exercises. Notes will be provided before the course.

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading given before the course, and preparation of a poster of the course. Certificates will be issued based on active participation in the entire course.

Participants

Participants are expected to have basic knowledge of material science and building physics. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from course participation. All lectures will be given in English.

Participating institutions

The general venue of the event is the Technical University of Denmark, Lyngby campus. The doctoral course segment will take place 15-19 August 2016. The course "surrounds" the international RILEM conference segment on Moisture in Materials and Structures, 21-24 August 2016 in materials and structures, 21-24 August 2016.

Venue and time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The doctoral course segment will take place 15-19 August 2016. The course "surrounds" the international RILEM conference segment on Moisture in Materials and Structures, 21-24 August 2016.

Registration, price and accommodation

The deadline for doctoral course registration is Sunday, 1 May 2016 through the conference website. There is a limit of 24 participants. A course fee of EUR 250 applies for the entire course. The course fee covers participation in the entire course, study material, refreshments, a barbecue and a dinner. Participants will be responsible for travel, meals, accommodation and travel to Lund University during the course. A limited number of hotels in central Copenhagen have been made available for use by participants. Pre-bookings will be made by the organising committee.

Further information

Further information can be found at the home page of the general event www.conferencemanager.dk/MSSCE2016 - or you may contact the course responsible:

Kurt K. Hansen
MSSCE2016.Moisture@byg.dtu.dk
Technical University of Denmark
Department of Civil Engineering
Knut's Vest 214, (mob: +45) 9923 4549

Materials, Systems and Structures in Civil Engineering – MSSCE 2016

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Scientific sponsor

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Scientific sponsor

RILEM EAC
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

Organizers

O.M. Jensen, K. Kovler, N. de Belie

Teachers

TBA

Sponsored by

RILEM EAC
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

Concrete with Supplementary Cementitious Materials

Lyngby, Denmark, 15-19 August 2016

Doctoral course segment on
Scope of doctoral course segment

Hydraulic and pozzolanic industrial by-products, natural resources and societal waste are increasingly being used as valuable, supplementary cementitious materials (SCMs) in concrete. Materials such as fly ash, blast-furnace slag, silica fume, calcined clay and limestone are important to obtain concrete with improved and targeted properties and not the least to make the construction industry more sustainable and less CO₂-intensive. The doctoral course segment on the PhD-project presentations by participants at the doctoral course precedes the international RILEM conference segment on Concrete with supplementary cementitious materials, 21-24 August 2016. The course precedes the general venue of the event is the Technical University of Denmark, Lyngby campus.

The course consists of lectures, written exercises and hands-on laboratory exercises. Notes will be provided before the course. The course will cover the most important topics in relation to the use of SCMs in concrete technology including:

- Properties of SCM
- Mix proportions
- Fresh concrete
- Hydration reactions
- Hardened concrete
- Durability aspects

The doctoral course segment will take place 15-19 August 2016. The course precedes the doctoral course segment will take place 15-19 August 2016. The course consists of lectures, written exercises and hands-on laboratory exercises. Notes will be provided before the course. The course will cover the most important topics in relation to the use of SCMs in concrete technology including:

- Properties of SCM
- Mix proportions
- Fresh concrete
- Hydration reactions
- Hardened concrete
- Durability aspects

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading given before the course, and preparation of a poster project presentation for the course. Certificates will be issued based on active participation in the course. The course consists of lectures, written exercises and hands-on laboratory exercises. Notes will be provided before the course. The course will cover the most important topics in relation to the use of SCMs in concrete technology including:

- Properties of SCM
- Mix proportions
- Fresh concrete
- Hydration reactions
- Hardened concrete
- Durability aspects

Participants

Participants are expected to have a basic knowledge of concrete technology. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from the course. Participants are expected to have a basic knowledge of concrete technology. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from the course.

Venue and time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The doctoral course segment will take place 15-19 August 2016. The course precedes the international RILEM conference segment on Concrete with supplementary cementitious materials, 21-24 August 2016. The course will be held at the Technical University of Denmark, Lyngby campus.

Registration, price and accommodation

The deadline for conference registration is Friday, 8 July 2016 through the conference website. A course fee of EUR 250 applies for the course. The course fee covers meals, refreshments, a barbecue and a dinner. Participants will be responsible for travel and accommodation. Pre-bookings of rooms have been made at hotels in central Copenhagen, however, participants need to make their own accommodation arrangements. Further information can be found at the home page of the general event www.conferencemanager.dk/MSSCE2016 or you may contact the segment responsible: Ole Mejlhede Jensen MSSCE2016.SCM@byg.dtu.dk

Further information

Further information can be found at the home page of the general event www.conferencemanager.dk/MSSCE2016 or you may contact the segment responsible: Ole Mejlhede Jensen MSSCE2016.SCM@byg.dtu.dk.

Course content

The course will cover the most important topics in relation to the use of SCMs in concrete technology including:

- Properties of SCM
- Mix proportions
- Fresh concrete
- Hydration reactions
- Hardened concrete
- Durability aspects

Work load, evaluation and certificates

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- Properties of SCM
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Materials, Systems and Structures in Civil Engineering – MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The doctoral course segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of teaching in materials and structures
- Reliability and safety
- Value of information in structural health monitoring
- Service life of cement-based materials and structures
- Historical masonry
- Wood science
- Electrochemistry in civil engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious materials
- Frost action in concrete
- Sim. tools in the execution phase of concr. struct.
- Biobased building materials
- Soils, rocks and geotechnical engineering
- Cold region engineering
- Building materials and indoor environment
- BIM in civil engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RILEM Week 2016

RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RILEM has the aim to promote scientific cooperation. The event described in this folder relates to the Annual RILEM Week 2016 (21-24 Aug 2016). The RILEM Week is the highlight of the RILEM calendar each year and includes meetings in many of RILEM’s technical and administrative committees. More information about RILEM can be found at www.rilem.net

Scientific sponsor

This doctoral course will partly be sponsored by the International Centre for Indoor Environment and Energy (ICIEE.DTU), Danish Institute of Technology (DTI), Danish Building Research Institute (SBi.AAU) and COST Action TU1302, NORM for Building material.

Organizing committee

Pawel Wargocki, Lisbeth Ottesen, Bjarne W. Olesen, Technical University of Denmark
Thomas Witterseh, Danish Institute of Technology
Lars Gunnarsen, Danish Building Research Institute (SBi), Aalborg University

Scientific committee

To be announced

Sponsored by

COST Action TU1302
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Scope of doctoral course segment

Building materials have a significant influence on the indoor environmental quality. Emissions from materials will influence the indoor air quality and the requirements for ventilation. Other indoor environmental parameters like acoustic and lighting conditions are influenced by the surface materials used.

Course Contents

- Emission from building materials (particles, gasses)
- Tools for predicting the effect of building materials on the indoor environment
- Air Cleaning (adsorption, chemical reactions)
- Emission from building materials
- General requirements for indoor environment
- General Indoor environment testing and certification of materials (chemical, odours)

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points. Participants are expected to have a basic knowledge of indoor environment and building materials. Additional study material will be provided.

Venue and time

24 August 2016.

The doctoral course segment will take place 15-19 August 2016. The course precedes the international RILEM conference segment on Building materials and Indoor Environment, 21-24 August 2016. The general venue of the event is the Technical University of Denmark, Lyngby campus.

Participants

Participants are expected to have a basic knowledge of indoor environment and building materials. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from course participation. All lectures will be given in English.

Participants should register before 8 July 2016 through the event home page www.conferencemanager.dk/MSSE2016. A course fee of EUR 250 applies for the entire course. The course fee covers participation in the doctoral course part of MSSCE 2016 and includes study material, refreshments, a barbecue and a downtown dinner. Participants will be responsible for travel, meals and accommodation. Further information can be found at the home page of the general event www.conferencemanager.dk/MSSE2016 - or you may contact the segment responsible Bjarne W. Olsen.
Materials, Systems and Structures in Civil Engineering – MSSCE 2016

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- Innovation of teaching in materials and structures
- Reliability, Safety and Value of Information
- Service life of cement-based materials and structures
- Historical masonry
- Electrochemistry in Civil Engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious mater.
- Frost action in concrete
- Sim. tools in the execution phase of concr. struct.
- Clay and Shale
- Cold region engineering
- Building materials and indoor environment
- BIM in Civil Engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

Financial sponsors
The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

RI LEM Week 2016
RI LEM is the international union of laboratories and experts in construction materials, systems, and structures. RI LEM has the aim to promote scientific cooperation. The event described in this folder relates to the Annual RI LEM Week 2016 (21-24 Aug 2016). The RI LEM Week is the highlight of the RI LEM calendar each year and includes meetings in many of RI LEM’s technical and administrative committees. More information about RI LEM can be found at www.rilem.net

Scientific sponsor
RI LEM is scientific sponsor of the doctoral course segment. All doctoral students registered in the course are offered a 3-year free RI LEM membership.

Organizer
J. Karlshøj

Teachers
J. Karlshøj
TBA

Sponsored by
RI LEM EAC
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark

Materials, Systems and Structures in Civil Engineering – MSSCE 2016

Doctoral course segment on

B I M in Civil Engineering - focusing on open standards

Lyngby, Denmark, 15-19 August 2016
The purpose of the course is to demonstrate the correlation between content and methods developed by buildingSMART for identification, modeling and implementation of digitally supported information flow between the parties involved in creating and operating buildings and structures in the built environment.

Course contents

• Examination of the data model Industry Foundation Classes (IFC) and the Express language in which the data model is defined.
• Review of the principles of the Model View Definition (MVD) that is used to identify the subset that is implemented in software products.
• Through the use of Information Delivery Manual (IDM) it is described how user requirements can be recorded, structured and formalized.
• The buildingSMART Data Dictionary (bSDD) is reviewed and it is explained how the content from the dictionary can be operationalized and extended.
• Review of the principles in buildingSMART's Software Certification procedure and explanation of the concept for Data Validation based on the use of mvdXML.
• Demonstration of an IFC Model Server that is tested through exercises.

The course consists of lectures, written exercises and hands-on exercises in using buildingSMART tools.

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading given before the course, and preparation of a case study for the course. Certificates will be issued based on active participation in the entire course.

Participants

Participants are expected to have a basic knowledge of BIM. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from course participation. All lectures will be given in English.

Venue and time

Venue of the event is the Technical University of Denmark, Lyngby campus. The doctoral course segment will take place 15-19 August 2016. The course precedes the Building Information Modeling 2016 (BIM) conference that will take place 21-23 August 2016. The course fee covers the doctoral course segment and includes study material, refreshments, a barbecue and a dinner. Participants are responsible for travel, meals and accommodation.

Further information

Further information can be found at the home page of the general event:

http://www.conferencemanager.dk/MSSCE2016/13bim-dc.html

or you may contact the segment responsible:

Jan Karlshøj
Department of Civil Engineering
Technical University of Denmark
MSSCE2016.BIM@byg.dtu.dk

Registration, price and accommodation

The deadline for event registration is Friday, 8th July 2016. The course fee of EUR 250 applies for the entire course. The course fee covers participation in the course, the course fees, study material, refreshments and barbecue. Participants are responsible for travel, meals and accommodation. Pre-bookings of rooms have been made at various hotels in central Copenhagen. Hotels are mentioned on the registration website. Participants are responsible for travel, meals and accommodation.

The course covers the following topics:

Course contents

The course is designed to provide an overview of the research project and to introduce students to the methods and tools used in the project. The course is intended for doctoral students and researchers who are interested in buildingSMART technologies and their applications in the construction industry.

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading and final project report. The course fee includes study material, refreshments, a barbecue and a dinner. Participants are responsible for travel, meals and accommodation.

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Materials, Systems and Structures in Civil Engineering - MSSCE 2016

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- Innovation of teaching in materials and structures
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- Service life of cement-based materials and structures
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- Concrete with supplementary cementitious materials
- Frost action in concrete
- Sim. tools in the execution phase of concrete structures
- Clay and Shale
- Cold region engineering
- Building materials and indoor environment
- BIM in civil engineering

More information about MSSCE 2016 can be found at www.conferencemanager.dk/MSSCE2016

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RI LEM Week 2016

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Scientific sponsor

RI LEM is scientific sponsor of the doctoral course segment through the RI LEM Educational Activities Committee, EAC. Since its formation in 2006 RI LEM EAC has sponsored about 100 high-level courses all over the world. All doctoral students registered in the course are offered a 3-year free RI LEM membership.

Organizers

I.L. Fabricius, Varvara Zania, Louise Belmonte

Teachers

E. Makovicky, A Revil, R. Holt, L. Andersen, F. Engstrøm, N. Foged

Sponsored by

RI LEM EAC
DTU Byg
Knud Højgaard Foundation, Denmark
Larsen & Nielsen Foundation, Denmark
Scope of doctoral course segment

Properties of clay and shale as substrate for construction is a field with many question marks. A lack of physical and chemical understanding of properties of these rocks is also critical in the context of sealing membranes and seals in connection with subsurface storage of heat, CO2, and hydrocarbons. Reservoir properties of shale itself is also a focus of debate. The doctoral course segment will bring you up-to-date on this important area.

Lecture program

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecturer</th>
<th>Institution/Company</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Prof. Emil Makovicky</td>
<td>University of Copenhagen</td>
<td>Clay mineralogy</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Prof. André Revil</td>
<td>University of Savoie, Mont Blanc</td>
<td>Clay properties</td>
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<tr>
<td>Wednesday</td>
<td>Prof. Lars Vabbersgaard Andersen</td>
<td>University of Ålborg</td>
<td>Constitutive modeling of clay</td>
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<tr>
<td>Thursday</td>
<td>Prof. Rune Holt</td>
<td>Norwegian University of Science and Technology</td>
<td>Shale Rock Physics &amp; Rock Mechanics</td>
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<tr>
<td>Friday</td>
<td>Prof. Niels Foged</td>
<td>Technical University of Denmark</td>
<td>Fehmarn Belt Fixed Link</td>
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<tr>
<td>Friday</td>
<td>Dr. Finn Engstrøm</td>
<td>Mærsk Oil Petrophysics</td>
<td>Fehmarn Belt Fixed Link</td>
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</table>

Participating institutions:

- Department of Civil Engineering, Technical University of Denmark
- DaF Nordic, University of Copenhagen
- DTU, Technical University of Denmark
- The University of Ålborg
- Norwegian University of Science and Technology
- Technical University of Denmark
- University of Savoie, Mont Blanc
- Mærsk Oil Petrophysics

Course contents

The course will cover the most important topics in relation to properties of shale and clay including: Elasticity, Pore collapse, Creep, Fracturing, Pore water effects, Electrical properties.

Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading given before the course, and preparation of a poster presentation. Certificates will be issued based on active participation in the entire course.

Participants

Participants are expected to have a basic knowledge of one of the disciplines: geotechnics, petrophysics, and rock physics. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from course participation. All lectures will be given in English. Further information about the course can be found at the home page of the general event.

Registration, price and accommodation

The deadline for event registration is Friday, 8 July 2016 through the conference website. A course fee of EUR 250 applies for the entire course. The course fee covers participation in the doctoral course part of MSSCE 2016 and includes study material, refreshments, a barbecue, and a dinner. Participants are expected to have a basic knowledge of one of the disciplines: geotechnics, petrophysics, and rock physics. The course has a focus on service, and preparation of a poster presentation. The total work load is approximately 140 hours, including the period at DTU, preparatory reading given before the course. The course fee of EUR 250 applies for the entire course. The reading for event registration is Friday 8 July 2016 through the conference website.
<table>
<thead>
<tr>
<th>Date</th>
<th>MSSCE2016 Doctoral Courses</th>
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<th>Technical Committee Meeting</th>
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<td>STEVE HURST</td>
<td>Cranage Bridge, UCD</td>
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Sunday 21/08/2016

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Monday 22/08/2016

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Tuesday 23/08/2016

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Wednesday 24/08/2016

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Thursday 25/08/2016

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Friday 26/08/2016

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Saturday 27/08/2016

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Sunday 28/08/2016

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# MSSCE 2016 – Conference Opening

**Sunday 21/8 2016**

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<tr>
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<tr>
<td>16.40</td>
<td>Bus arrival from Open Air Museum and hotels</td>
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</table>
| 17.00 – 17.30 | Opening welcome                               | Oticon Hall Building 107 (Next to building 101) | Ole Mejlhede Jensen, Professor, Department of Civil Engineering, Technical University of Denmark, Chair of MSSCE2016, Honorary president of RILEM  
Niels Jørgen Aagaard, Head of Department of Civil Engineering, Technical University of Denmark  
Mette Glavind, Executive Vice President, Building and Construction, Danish Technological Institute  
Johan Vyncke, President of RILEM, Director of research and innovation at the Belgian Building Research Institute |
<p>| 17.30 – 18:20 | Key-note                                      | Oticon Hall Building 107 (Next to building 101) | Jan Søndergaard, Professor in architecture at the Royal Danish Academy of Fine Arts and partner in KHR Architects |
| 18.20 – 18.55 | Welcome drink                               | Oticon Hall Building 107 (Next to building 101) |                                               |
| 19.00 – 20.00 | Buffet dinner                                | Canteen Building 101             |                                               |
| 20.15   | Busses depart to hotels                      | Parking lot outside building 101, in the DTU central axis |                                               |</p>
<table>
<thead>
<tr>
<th>Session</th>
<th>Paper</th>
<th>Presenter</th>
<th>Chairman</th>
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</thead>
</table>
| **Session 1**  
08.30-10.15 | No sessions                                                          |                                     |                |
| **Location:** |                                                                     |                                     |                |
| **Coffee Break**  
10.15-10.45 |                                                                      |                                     |                |
| **Session 2**  
10.45-12.30 | No sessions                                                          |                                     |                |
| **Location:** |                                                                     |                                     |                |
| **Lunch Break**  
12.30-13.30 |                                                                      |                                     |                |
| **Session 3**  
13.30-15.00 | Innovation of Teaching in Materials and Structures                   | Teaching Concrete Technology to Undergraduates: An Inductive Approach | Ravindra Gettu |
| **Location:** | Building 116, room 025                                              | Active learning strategies in reinforced concrete | Per Goltermann |
|             | Learning traditional building techniques by practical work and implemented theory | Paulo Cachim                         |                |
|             | Influence of introduction of e-based distance learning on student experience and performance | Kristin Balksten and Petra Eriksson |                |
| **Coffee Break**  
15.00-15.30 |                                                                      |                                     |                |
| **Session 4**  
15.30-17.00 | Innovation of Teaching in Materials and Structures                   | Innovating a classic course in concrete structures | Per Goltermann |
| **Location:** | Building 116, room 025                                              | "From Microstructure to Service Life Design", a theoretical-practical RILEM International Workshop | Per Goltermann |
|             |                                                                      | Roberto Torrent, Karen Scrivener and Luis Fernández Luco. |                |
## MSSCE 2016 – Segment Programme

### Tuesday 23/8 2016

**Reliability, Safety and Value of Information**

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper</th>
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<tbody>
<tr>
<td><strong>Session 1</strong></td>
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<tr>
<td>08.30 – 08.50</td>
<td><strong>Monitoring the structural response of reinforced concrete poles at high-speed railway tracks due to train passings</strong>&lt;br&gt;Luise Göbel, Felix Mucha, Zouhour Jaouadi, Dmitrii Legatiuk, Igor Kavrakov, Kay Smarsly, Lars Abrahamczyk and Matthias Kraus</td>
<td>Sebastian Thöns</td>
</tr>
<tr>
<td>08.55 – 09.15</td>
<td><strong>Monitoring of the prestressed concrete slabs with unbonded tendons during erection and in use</strong>&lt;br&gt;Rafal Szydlowski, Mariusz Maslak and Michal Pazdanowski.</td>
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<tr>
<td>09.20 – 09.40</td>
<td><strong>Reliability assessment of Saint Joseph Church in Prague based on monitoring</strong>&lt;br&gt;Jana Markova, Miroslav Sykora and Ivo Simunek</td>
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<tr>
<td>09.45 – 10.05</td>
<td><strong>The role of in-situ specimen measurements in appraising creep and shrinkage model predictions</strong>&lt;br&gt;Helder Sousa, Marios Chryssanthopoulos and Luis Oliveira Santos</td>
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<td><strong>Coffee Break</strong></td>
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<tr>
<td>10.15 – 10.45</td>
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<tr>
<td><strong>Session 2</strong></td>
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<td>10.45 – 11.05</td>
<td><strong>Value of information by Bayesian updating of model uncertainties in the context of logical and Daniels systems</strong>&lt;br&gt;Henning Brüske and Sebastian Thöns</td>
<td>Sebastian Thöns</td>
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<tr>
<td>11.10 – 11.30</td>
<td><strong>Investigation on Characteristics of Fall Accidents in Construction Industry</strong>&lt;br&gt;Tetsuo Hojo and Katsutoshi Ohdo</td>
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<td>11.35 – 11.55</td>
<td><strong>Nondestructive assessment of crack geometry in concrete structures using ultrasonic tomography</strong>&lt;br&gt;Krzysztof Schabowicz, Łukasz Radzik and Tomasz Gorzelańczyk</td>
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<td><strong>Lunch Break</strong></td>
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<td>13.30 – 15.00</td>
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<td>15.00 – 15.30</td>
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<td><strong>Session 4</strong></td>
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<tr>
<td>15.30 – 17.00</td>
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**Conference Dinner**<br>17.30-22.00
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<th>Paper</th>
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<tbody>
<tr>
<td>22/08 (Mon)</td>
<td>Welcome and WG1 plenary</td>
<td>Core group</td>
<td>Core group of COST TU1404</td>
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<tr>
<td>Session 1</td>
<td>Welcome (15 min.)</td>
<td>Core group</td>
<td>WG1 leaders</td>
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<tr>
<td>Location: Aud 81</td>
<td>WG1 - Plenary session.</td>
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<td>EXTENDED ROUND ROBIN TESTING PROGRAM OF COST ACTION TU1404 – LESSONS LEARNED FROM THE INITIAL EXPERIMENTAL PHASE</td>
<td>Marijana Serdar</td>
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<td>VERCORS MOCKUP – FIRST EXPERIMENTAL RESULTS AND SYNTHESIS OF THE BENCHMARK</td>
<td>Benoît Masson</td>
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<tr>
<td>Session 2</td>
<td>Session Advanced testing techniques</td>
<td>José Granja</td>
<td>Stéphanie Staquet</td>
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<tr>
<td>Location: Aud 81</td>
<td>BENDER-EXTENDER ELEMENTS FOR CHARACTERIZATION OF CEMENT PASTE AT EARLY AGES</td>
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<td>ON UTILISATION OF ELLIPTICAL RINGS FOR ASSESSING CRACKING TENDENCY OF CONCRETE AND OTHER CEMENT-BASED MATERIALS</td>
<td>Xiangming Zhou</td>
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<td>CARBON NANOPARTICLES CEMENT-BASED MATERIALS FOR SERVICE LIFE MONITORING</td>
<td>Paulo B. Cachim</td>
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<td>ULTRASONIC ASSESSMENT IN CURING PROCESS OF CBM USING EXPERIMENTAL MONITORING TESTS AND MICROSTRUCTURAL SIMULATION TOOLS</td>
<td>José Vicente Fuente</td>
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<td>MEASURING THE INFLUENCE OF TEMPERATURE ON ELECTRICAL PROPERTIES OF CONCRETE</td>
<td>Alex Coyle</td>
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| 22/08 (Mon)  
Session 3  
13.30-15.00  
Location:  
Aud 81 | Advanced testing techniques and eco-concrete  
NON-DESTRUCTIVE EVALUATION OF STRENGTH DEVELOPMENT IN CONCRETE  
USE OF ULTRASONIC P- AND S-WAVES TRANSMISSION VELOCITY FOR THE EARLY AGE BEHAVIOUR OF ECO-CONCRETE  
NON-DESTRUCTIVE EVALUATION OF ECO-FRIENDLY CEMENTITIOUS MATERIALS BY ULTRASOUND  
EFFECT OF RECYCLED AGGREGATE CONCRETE ON EARLY AGE BEHAVIOR | Ivan Gabrijel  
Start: 13.35  
Jérôme Carette  
Start: 13.55  
Markus Krüger  
Start: 14.15  
Ahmed Z. Bendimerad  
Start: 14.35 | Marijana Serdar |
| Coffee Break  
15.00-15.30 |                                                                      |                      |                      |
| Session 4  
15.30-17.00  
Location:  
Aud 81 | Eco-concrete  
MECHANICAL ACTIVATION OF SUPPLEMENTARY CEMENTITIOUS MATERIALS IN ORDER TO USE AS HYDRAULIC BINDER  
PROPERTIES OF CONCRETE RECYCLING CLAY-RICH DREDGING SEDIMENTS AS A NOVEL SUPPLEMENTARY CEMENTITIOUS MATERIAL  
WASTE CERAMICS AS PARTIAL CEMENT AND AGGREGATE REPLACEMENTS IN SELF-COMPACTING CONCRETE  
CHLORIDE PENETRATION COEFFICIENT AND FREEZE-THAW DURABILITY OF WASTE META KAOLIN CONTAINING HIGH STRENGTH SELF-COMPACTING CONCRETE | Gábor Mucsi  
Start: 15.35  
Céline Van Bunderen  
Start: 15.55  
Paul Archbold  
Start: 16:15  
Diana Bajare  
Start: 16:35 | Jérôme Carette |
## Tuesday 23/8 2016

Service Life of Cement-Based Materials and Structures - Slot #1

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<td>23/08 (Tue)</td>
<td>Microstructural modelling I</td>
<td>CAN A RELIABLE PREDICTION OF CEMENT PASTE TRANSPORT PROPERTIES BE MADE USING MICROSTRUCTURE MODELS?</td>
<td>Ravi A. Patel</td>
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<td>Microstructural modelling II</td>
<td>CEMRS: FAST AND EFFICIENT MODELLING PLATFORM FOR THE SIMULATION OF CEMENTITIOUS SYSTEMS</td>
<td>Shiju Joseph</td>
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<td>Microstructural modelling II</td>
<td>NANO SCALE SIMULATIONS OF CEMENT FORMATION AND STRUCTURAL EVOLUTION: A NEW KINETIC APPROACH</td>
<td>Enrico Masoero</td>
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<td>Microstructural modelling II</td>
<td>THE IMPORTANCE OF MULTIPHYSICS AND MULTISCALE MODELLING OF CONCRETE TO UNDERSTAND ITS COMPLEX MACROSCOPIC PROPERTIES</td>
<td>Jörg F. Unger</td>
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<td>Microstructural modelling II</td>
<td>MODELLING OF AGEING OF LOW-PH CONCRETES</td>
<td>Laurie Buffo-Lacarrière</td>
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**Coffee Break**
10.15-10.45

**Session 2**
10.45-12.30

**Location:**
Aud 81

**Session 3**
13.30-15.00

**Location:**
Aud 81

**Coffee Break**
15.00-15.30
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<td>Macroscopic</td>
<td><strong>modelling</strong></td>
<td>Pierre Rossi</td>
<td>Farid Benboudjema</td>
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<td><strong>FINITE ELEMENT MODELS CAPABLE TO GIVE</strong></td>
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<td><strong>DETAILED INFORMATION ABOUT CRACKS</strong></td>
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<td><strong>SPACING AND OPENING IN CONCRETE</strong></td>
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<td><strong>STRUCTURES IN SERVICE LIFE CONDITIONS</strong></td>
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<td><strong>CONTEMP – A VIRTUAL THERMO-MECHANICAL SIMULATOR FOR HYDRATING</strong></td>
<td>Vít Šmilauer</td>
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<td><strong>REINFORCED CONCRETE BLOCKS WITH EXTENSION TO SERVICE LIFE</strong></td>
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<td><strong>NUMERICAL SIMULATION SINCE EARLY AGES OF THE RGB BEAM TEST</strong></td>
<td>Maria D. Crespo</td>
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<td><strong>CONCRACK BENCHMARK BY MEANS OF A 3D FIBRE FRAME MODEL</strong></td>
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<td><strong>COMPUTATIONAL PREDICTION OF RESTRAINT-INDUCED MACROCRACK PATTERNS</strong></td>
<td>Dirk Schlicke</td>
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<td><strong>IN CONCRETE WALLS</strong></td>
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<td><strong>Conference Dinner</strong></td>
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<td><strong>17.30-22.00</strong></td>
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</table>
**Wednesday 24/8 2016**

**Service Life of Cement-Based Materials and Structures - Slot #1**

<table>
<thead>
<tr>
<th>Session</th>
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</thead>
</table>
| **24/08 (Wed)**  
**Session 1**  
08.30-10.15  
*Location: Room 19* | HPC and FRC  
MECHANICAL PROPERTIES OF ULTRA HIGH PERFORMANCE FIBRE REINFORCED CONCRETE | Radoslav Sovják  
Start: 8.35 | Terje Kanstad |
| | | STUDY ON THE EFFECTS OF DEFORMED STEEL FIBRES ON STRENGTHENING AND TOUGHENING OF ULTRA-HIGH PERFORMANCE CONCRETE | Gai-Fei Peng  
Start: 8.55 |
| | | NUMERICAL MODELLING OF FRACTURE OF MACRO-POLYMER FIBER REINFORCED CONCRETE | Jaime C. Galvez  
Start: 9.15 |
| | | AN INVESTIGATION ON USABILITY OF BASALT FIBRE IN CEMENT-BASED COMPOSITES | Emre Sancak  
Start: 9.35 |
| | | USABILITY OF BASALT FIBRES IN FIBRE REINFORCED CEMENTITIOUS COMPOSITES | Z.Canan Girgin  
Start: 9.55 |
| **Coffee Break**  
10.15-10.45 |  |  |  |
| **Session 2**  
10.45-12.30  
*Location: Room 19* | Long term performance of RC  
RESIDUAL CONCRETE STRENGTH AFTER SUSTAINED LOAD: EXPERIMENTAL RESULTS AND MODELLING APPROACH | Matthieu Briffaut  
Start: 10.50 | Miguel Ferreira |
| | | IMPACT OF SLAG CONTENT IN ALKALI-ACTIVATED SLAG CEMENT ON POROSITY OF CONCRETE | Igor Rudenko  
Start: 11.10 |
| | | AGING TESTS FOR PERFORMANCE OF PHOTOCATALYTIC CEMENT BASED MATERIALS | František Peterka  
Start: 11.30 |
| | | EFFECTS OF CURING TEMPERATURE ON CHLORIDE MIGRATION AND ELECTRICAL RESISTIVITY OF CONCRETE | T. Alper Yikici  
Start: 11.50 |
| **Lunch Break**  
12.30-13.30 |  |  |  |
| **24/08 (Wed)**  
**Session 3**  
13.30-15.00  
*Location: Aud 82* | Design  
Session takes place in Auditorium 82  
(see program of slot #2) |  |  |
| **Coffee Break**  
15.00-15.30 |  |  |  |
| **Session 4**  
15.30-17.00  
*Location: Aud 82* | WG3 plenary  
WG Plenary, Closing and MC meeting  
Session takes place in Auditorium 82  
(see program of slot #2) |  |  |
## MSSCE 2016 – Segment Programme

### Monday 22/8 2016

**Service Life of Cement-Based Materials and Structures - Slot #2**

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| **22/08 (Mon)**  
*Session 1*  
08.30-10.15 | Welcome and plenary session in Auditorium 81 (see program of slot #1) | | |
| **Coffee Break**  
10.15-10.45 | | | |
| **22/08 (Mon)**  
*Session 2*  
10.45-12.30 | Chlorides in concrete I  
PREDICTING CHLORIDE INDUCED DEPASSIVATION AND MINIMUM CONCRETE COVER WITH DIFFERENT BINDERS  
CHLORIDE DIFFUSION AND BINDING IN HARDENED CEMENT PASTE FROM MICROSCALE ANALYSES  
A RISK-BASED MODEL FOR DETERMINING ALLOWABLE ADMIXED CHLORIDE LIMITS IN CONCRETE  
MODELLING OF CHLORIDE TRANSPORT IN UNSATURATED CONCRETE: STUDY OF ELECTROCAPILLARY EFFECT  
CONDITION ASSESSMENT OF REINFORCED CONCRETE ELEMENTS EXPOSED TO CARBONATION | Ingemar Löfgren  
Start: 10.50 | Guang Ye |
| **Lunch Break**  
12.30-13.30 | | | |
| **Session 3**  
13.30-15.00 | Chlorides in concrete II  
CHLORIDE ION DIFFUSION IN CONCRETE UNDER TENSILE LOAD  
MODELLING OF TRANSPORT OF CHLORIDE IONS IN CONCRETE UNDER COMRESSIVE LOAD  
AVOIDING OVERFITTING IN INVERSE MODELING OF CHLORIDE MIGRATION IN CONCRETE  
SERVICE LIFE PREDICTION OF A CEMENTITIOUS COATING SYSTEM BASED ON CHLORIDE-INDUCED CORROSION | Ling Wang  
Start: 13.35 | Sreejith V. Nanukuttan |
| **Coffee Break**  
15.00-15.30 | | | |
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<tr>
<td>Session 4</td>
<td>EVALUATION OF CONCRETE’S RESISTANCE TO PHYSICAL SULFATE SALT ATTACK</td>
<td>Semion Zhutovsky</td>
<td>David Trejo</td>
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<td>15.30-17.00</td>
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<tr>
<td>Location:</td>
<td>COMPARATIVE ANALYSIS OF COMPRESSIVE STRENGTH AND VOLUME CHANGE FOR DETERMINATION OF SULFATE RESISTANCE OF RAC</td>
<td>Vlastimir Radonjanin</td>
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<tr>
<td>Aud 82</td>
<td>REMAINING SERVICE LIFE OF RAILWAY PRESTRESSED CONCRETE SLEEPERS</td>
<td>Sakdirat Kaewunruen</td>
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<td></td>
<td>DEFINITION OF DAMAGE DISTRIBUTION DUE TO INTERNAL EXPANSIVE REACTIONS IN LONG TERM CONCRETE STRUCTURES</td>
<td>Esperanza Menéndez</td>
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*Start times are 15:35, 15:55, 16:15, and 16:35 respectively.*
# Tuesday 23/8 2016

Service Life of Cement-Based Materials and Structures - Slot #2

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<tr>
<td>23/08 (Tue)</td>
<td>SCM and shrinkage</td>
<td>VOLUME STABILITY OF ALKALI ACTIVATED PORTLAND CEMENT CONCRETES WITH ALKALI-SUSCEPTIBLE AGGREGATES</td>
<td>Igor Rudenko</td>
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<tr>
<td>Session 1</td>
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<td>BASIC AND DRYING SHRINKAGE OF INFRASTRUCTURE CONCRETES WITH VARIABLE FLY ASH CONTENT</td>
<td>Anja Klausen</td>
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<td></td>
<td></td>
<td>EFFECT OF GRANULATED BLAST FURNACE SLAG ON THE DURABILITY OF SELF COMPACTING CONCRETE IN HOT ENVIRONMENT</td>
<td>Said Kenai</td>
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<td></td>
<td></td>
<td>EXPERIMENTAL AND NUMERICAL INVESTIGATION OF DRYING EFFETS ON CONCRETE'S MECHANICAL PROPERTIES</td>
<td>François Soleilhet</td>
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<td>COMPARISON OF MEASURED AND PRESCRIBED K-VALUES FOR THE EQUIVALENT PERFORMANCE OF FLY ASH CONCRETE</td>
<td>T. Altuğ Söylev</td>
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<tr>
<td>10.15-10.45</td>
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<tr>
<td>Session 2</td>
<td>Shrinkage</td>
<td>PLASTIC SHRINKAGE CRACKING IN SELF-COMPACTING CONCRETE: A PARAMETRIC STUDY</td>
<td>Faez Sayahi</td>
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<td>10.45-12.30</td>
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<td>MITIGATION OF EARLY AGE SHRINKAGE OF UHPFRC BY USING SPENT EQUILIBRIUM CATALYST</td>
<td>Ana Mafalda Matos</td>
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<td>Location: Aud 82</td>
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<td>EXPERIMENTAL AND NUMERICAL ANALYSIS OF DRYING SHRINKAGE ON CEMENT-BASED MATERIALS</td>
<td>Marie Malbois</td>
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<td>SIZE EFFECT ON THE DRYING SHRINKAGE</td>
<td>Aveline Darquennes</td>
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<td>12.30-13.30</td>
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<tr>
<td>Session 3</td>
<td>WG2 plenary</td>
<td>WG2 - Plenary session in Auditorium 81 (see program of slot #1)</td>
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<td>Coffee Break</td>
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<td>15.00-15.30</td>
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<tr>
<td>Session 4</td>
<td>SAP’s and Self-healing</td>
<td>QUANTIFICATION THE FILLING OF MICROCRACKS DUE TO AUTOGENOUS SELF-HEALING IN CEMENT PASTE</td>
<td>Jiayi Chen</td>
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<td>15.30-17.00</td>
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<td>WATER RELEASE PROCESS OF SUPERABSORBENT POLYMERS IN CEMENT PASTE AT EARLY AGE</td>
<td>Yujiang Wang</td>
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<td>Location: Aud 82</td>
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<td>BIO-BASED PH-RESPONSIVE SUPERABSORBENT POLYMERS FOR SELF-HEALING CRACKS IN CONCRETE</td>
<td>Arn Mignon</td>
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<td>IMPACT OF BIOGENIC SELF-HEALING ADDITIVE ON PERFORMANCE OF CEMENT-BASED MORTAR</td>
<td>Ali Amiri</td>
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**Conference Dinner**

17.30-22.00
### Service Life of Cement-Based Materials and Structures - Slot #2

#### Session 1
08.30-10.15

**Location:** Aud 82

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<tr>
<td>24/08 (Wed)</td>
<td>Corrosion</td>
<td>MULTIDEPHT CORROSION MONITORING SYSTEM</td>
<td>Dalibor Sekulic</td>
<td>Loping Tang</td>
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<tr>
<td>08.30</td>
<td>MULTIDEPHT CORROSION MONITORING SYSTEM EVALUATION AND APPLICATION</td>
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<tr>
<td>08.45</td>
<td>SENSITIVITY ANALYSIS FOR PREDICTION OF CORROSION INITIATION BY CARBONATION</td>
<td>Van Loc Ta</td>
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<td>09.00</td>
<td>EXPERIMENTAL STUDY OF CORROSION-INDUCED DEGRADATION OF REINFORCED CONCRETE ELEMENTS</td>
<td>Olfa Loukil</td>
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<td>09.15</td>
<td>COUPLING LIMIT STATES OF CORROSION INITIATION AND CORROSION INDUCED CRACK OPENING – SENSITIVITY ANALYSIS OF MODEL PARAMETERS</td>
<td>Miguel Ferreira</td>
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<td>09.30</td>
<td>INFLUENCE OF FIBRE REINFORCEMENT ON THE INITIATION OF CORROSION-INDUCED CRACKS</td>
<td>Carlos G. Berrocal</td>
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**Coffee Break**
10.15-10.45

**Session 2**
10.45-12.30

**Location:** Aud 82

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<td>10.45</td>
<td>Structural behaviour</td>
<td>SOME EXAMPLES ON SHRINKAGE RESTRAINT EFFECTS ON CONCRETE AND CONCRETE STRUCTURES</td>
<td>Farid Benboudjema</td>
<td>Dirk Schlicke</td>
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<td>10.50</td>
<td>CONTROL OF EARLY AGE CRACKING IN A MASSIVE TUNNEL STRUCTURE BASED ON EXPERIMENTAL INVESTIGATIONS AND NUMERICAL SIMULATIONS</td>
<td>Wibke Heinrichs</td>
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<td>10.55</td>
<td>HARDENING INDUCED STRESSES IN VERY THICK CONCRETE MEMBERS – INSIGHTS FROM COMPREHENSIVE FE-STUDIES</td>
<td>Peter Joachim Heinrich</td>
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<td>11.00</td>
<td>INFLUENCE OF RESTRAINED SHRINKAGE IN RC BUILDING SLABS: A CASE STUDY</td>
<td>Carlos Sousa</td>
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<td>11.10</td>
<td>EXPERIMENTAL INVESTIGATION ON STRAIN DISTRIBUTION IN REINFORCEMENT OF RC SPECIMENS UNDER TENSION LOADING</td>
<td>Gintaris Kaklauskas</td>
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**Lunch Break**
12.30-13.30
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<td><strong>24/08 (Wed)</strong>&lt;br&gt;<strong>Session 3</strong>&lt;br&gt;13.30-15.00&lt;br&gt;<strong>Location:</strong> Aud 82</td>
<td>Design</td>
<td>SERVICE LIFE DESIGN AND ASSESSMENT FOR CONCRETE STRUCTURES IN HZM SEA LINK PROJECT FOR 120 YEARS</td>
<td>Kefei Li&lt;br&gt;Start: 13.35</td>
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<td>A NEW ANALYTICAL APPROACH IN MODELLING OF CRACKING OF RC MEMBERS</td>
<td>Gintaris Kaklauskas&lt;br&gt;Start: 13.55</td>
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<td>DEVELOPING AN ENGINEERING APPROACH FOR MIGRATING FROM PRESCRIPTIVE TO PERFORMANCE-BASED SPECIFICATION FOR CONCRETE</td>
<td>Sreejith Nanukuttan&lt;br&gt;Start: 14.15</td>
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<td>CRACK WIDTH CONTROL – VERIFICATION OF THE DEFORMATION COMPATIBILITY VS. COVERING THE CRACKING FORCE</td>
<td>Dirk Schlicke&lt;br&gt;Start: 14.35</td>
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<td><strong>Coffee Break</strong>&lt;br&gt;15.00-15.30</td>
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<td><strong>Session 4</strong>&lt;br&gt;15.30-17.00&lt;br&gt;<strong>Location:</strong> Aud 82</td>
<td>WG3 plenary</td>
<td>WG3 - Plenary session</td>
<td>WG3 Leaders</td>
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<td>Stéphanie Staquet</td>
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<td>MC Meeting (16h00m – 17h00m)</td>
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# MSSCE 2016 – Segment Programme

## Monday 22/8 2016

### Historical Masonry

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| **Session 1**  
08.30-10.15 | Natural Stone | 08:30-08:40 Welcome | Inge Rörig-Dalgaard and Ioannis Ioannou |
| **Location: Building 127 room 012** | 08:40-09:15 Keynote: Mineral Consolidants | George W. Scherer, Enrico Sassoni |
| | 09:15-09:35 Estimation of physical properties of volubilis calcarenite stone using non-destructive testing | Issam Aalil, Kévin Beck, Xavier Brunetaud, Khalid Cherkaoui, Ali Chaaba, Muzahim Al-Mukhtar |
| | 09:35-09:55 Use of local stone: cautionary tales | Edward Gerns, Rachel Will |
| | 09:55-10:15 Lessons learnt from the anomalous water sorptivity of stones: the case of a cypriot limestone | Cleopatra Charalambous, Ioannis Ioannou |
| **Coffee Break**  
10.15-10.45 | | | |
| **Session 2**  
10.45-12.30 | Mortars | 10:45-11:05 Fluid mortars for filling large cracks | Maria Stefanidou, Ioanna Papayianni |
| **Location: Building 127 room 012** | 11:05-11:25 Thermo-hydro-mechanical properties of repair mortars designed for the restoration of historical buildings in the Loire valley-France | Marwen Bouasker, Omar Abdulkareem, Amor Ben Fraj, Muzahim Al-Mukhtar, Kévin Beck |
| | 11:25-11:45 Durability of Air Lime mortar | Anders Nielsen |
| | 11:45-12:05 Catalytic effect of carbonic anhydrase enzyme on lime mortar carbonation | Özlem Cizer, Koen Van Balen, Carlos Rodriguez Navarro (Shiju Joseph) |
| | 12:05-12:25 Development of mortars in Denmark from the viking age until today | Mette Stubager Moesgaard, Thea Bech-Petersen, Helge Hansen |
| **Lunch Break**  
12.30-13.30 | | | |
| **Session 3**  
13.30-15.00 | Weathering and Conservation I | 13:50-13:50 Suitability of different paint coatings for renders based on natural hydraulic lime | Ana Paula Ferreira Pinto, Hugo Passinhas, Augusto Gomes, Bruna Silva |
<p>| <strong>Location: Building 127 room 012</strong> | 13:50-14:10 Assessment of flood and wind driven rain impact on mechanical properties of historic brick masonry | Victoria Stephenson, Yasemin D. Aktas, Dina D'Ayala |
| | | Barbara Lubelli Leo Pel |</p>
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<td>14:10-14:30</td>
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<td>Strain changes during the progress of water infiltration in tuffeau stone</td>
<td>Mohamed Ahmed Hassine, Kevin Beck, Xavier Brunetaud, Muzahim Al-Mukhtar</td>
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<td>14:30-14:50</td>
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<td>Comparative study of Prehistoric, traditional and contemporary adobe bricks from Cyprus</td>
<td>Maria Costi de Castrillo, Ioannis Ioannou, Maria Philokyprou</td>
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<td>15.30-17.00</td>
<td>Session 4</td>
<td>Poster session</td>
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<td>Location:</td>
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<td>15:30-15:35 Salt crystallization laboratory test with a complex brine</td>
<td>Beatriz Menéndez</td>
<td>Kévin Beck</td>
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<tr>
<td>Building 127</td>
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<td>15:35-15:40 Consolidating effects of nano-lime products on porous lime renders and limestone</td>
<td>Zuzana Slížková</td>
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<td>room 012</td>
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<td>15:40-15:45 Fibre reinforced plaster/render to out of plane behaviour of masonry</td>
<td>Miloš Drdácký</td>
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<td>15:45-15:50 Interior insulation retrofit of a brick wall using vacuum insulation panels: recreation of cultural historical values in buildings from before 1945</td>
<td>Pär Johansson, Paula Wahlgren</td>
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<td>15:50-15:55 The applicability and robustness of Interior Insulation</td>
<td>Søren Peter Bjarløv</td>
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**Tuesday 23/8 2016**

**Historical Masonry**

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<th>Session 2</th>
<th>10.45-12.30</th>
<th>Weathering and Conservation II Serve as an intro to the</th>
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<td>10:45-11:05 Influence of ph during Chemical weathering of bricks: Long term exposure</td>
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**Wednesday 24/8 2016**

**Historical Masonry**

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<tr>
<th>Location: Building 127 room 012</th>
<th>RILEM TC ASC, since it includes salt-related papers</th>
<th>11:05-11:25 Poulticing vs electrophoresis desalination of historic masonry, The case of the mill at Hoksem</th>
<th>Sebastiaan Godts, Hilde De Clercq, Roald Hayen</th>
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<td>11:25-11:45 Effect of application of lime plasters to salt-laden bricks</td>
<td>Cristiana Nunes and Zuzana Slížková</td>
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<td>11:45-12:05 Salt contaminated sandstone under environmental loading: recrystallization process and its consequences</td>
<td>Julie Desarnaud, Hannelore Derluyn, Lisa Grementieri, Luisa Molari, Stefano de Miranda, Veerle Cnudde, Noushine Shahidzadeh</td>
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<td>12:05-12:25 Wick action in porous building materials as studied by NMR</td>
<td>Raheleh Pishkari, Leo Pel</td>
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**Session**  
**Paper**  
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**Chairman**

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<tr>
<td>Session 1 08.30-10.15</td>
<td>Masonry Structures</td>
<td>08:30-09:05 Keynote: Behavior of historic masonry structures subjected to blast: testing, constitutive modeling and applications</td>
<td>Paulo B. Lourenco</td>
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<td>09:05-09:25</td>
<td>Experimental study of brick masonry walls subjected to eccentric and axial load</td>
<td>Cossima Cornado, Joan Ramon Rosell, Joan Leiva, Cesar Diaz</td>
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<tr>
<td>09:25-09:45</td>
<td>Numerical study on the seismic performance of adobe vaulted architecture: a case study from Iran</td>
<td>Neda H. Sadeghi, Daniel V. Oliveira, Mariana Correia, Hamed Azizi-Bondarabadi, Agustín Orduña</td>
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<td>09:45-10:05</td>
<td>Assessment of the injection of grouts to repair cracks in rammed earth</td>
<td>Rui A. Silva, Oriol Domínguez Martínez, Daniel V. Oliveira, Eduardo Pereira, Edgar Soares</td>
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<td>Case Studies</td>
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<td>10:45-11:05</td>
<td>Characterization of masonry materials and structural analysis of the st Mary of Carmel church in Famagusta</td>
<td>Rogiros Illampas, Ioannis Ioannou, Magdalini Theodoridou, Revecca Fournari</td>
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<td>11:05-11:25</td>
<td>Lime burning tradition of Gotland</td>
<td>Kristin Balksten</td>
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<td>11:25-11:45</td>
<td>Risk assessment and mitigation through hydrothermal modeling of historic masonry</td>
<td>Roald Hayen, Sebastiaan Godts</td>
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<td>11:45-12:05</td>
<td>“Electro-physical” methods to stop rising damp. Assessment of the effectiveness in two case studies</td>
<td>Barbara Lubelli, Rob P.J. van Hees, Linda Miedema, M. Fugazzotto, A. Sardella, A. Bonazza</td>
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<td>12:05-12:25</td>
<td>Determination of moisture distribution in Brick Masonry walls</td>
<td>Poul Klenz Larsen</td>
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<td>Closure – round table discussion on Masonry related issues</td>
<td>Ioannis Ioannou and Inge Röög-Dalgaard</td>
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## MSSCE 2016 – Segment Programme

### Monday 22/8 2016

**Electrochemistry in civil engineering**

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<tr>
<td><strong>Session 1</strong>&lt;br&gt;08.30-10.15</td>
<td>Diagnosis tools</td>
<td>Key note &lt;br&gt;Concrete electrical resistivity to evaluate reinforcement service life</td>
<td>Carmen Andrade</td>
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<tr>
<td><strong>Location:</strong> Building 116, room 44</td>
<td>On-site corrosion monitoring – reliability</td>
<td>Lucas Bourreau</td>
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<td>Laboratory and in-the-field experiences on the measurement of spontaneous potential in masonry affected by rising damp</td>
<td>Elisa Franzoni</td>
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<td><strong>Session 2</strong>&lt;br&gt;10.00-12.30</td>
<td>Corrosion</td>
<td>Polarization resistance of steel bar embedded in engineered cementitious composite under direct current exertion</td>
<td>Guanghui Zhang</td>
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<td><strong>Location:</strong> Building 116, room 44</td>
<td>Mathematical law of steel thickness loss versus time applied to reinforced concrete contaminated by chlorides – first results</td>
<td>Véronique Bouteiller</td>
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<td>Effect of phase distributions on the corrosion of quenched and self-tempered (qst) steel rebars</td>
<td>Radhakrishna G. Pillai</td>
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<td>Repair and maintenance (1)</td>
<td>Cathodic protection used on Danish coastal bridges</td>
<td>Ruth Elise Sørensen</td>
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<td><strong>Location:</strong> Building 116, room 44</td>
<td>Electrochemical investigation of carbon-based conductive coatings for application as anodes in ICCP system of reinforced concrete structures</td>
<td>Gino Ebell</td>
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<td>Quantitative expression of an organic corrosion inhibitor (pci-2014) for repairing steel bars in concrete contaminated with chloride</td>
<td>Zhiyong Liu, Zixiao Wang, Weibin Yang, Lei Yu</td>
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<td><strong>Session 4</strong>&lt;br&gt;15.30-17.00</td>
<td>Electrochemical injection of nanoparticles into concrete</td>
<td>Jiří Němeček</td>
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<td><strong>Location:</strong> Building 116, room 44</td>
<td>Electromigration of Li ions into cementitious materials as observed by NMR</td>
<td>Leo Pel</td>
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<td>Electrokinetic nanoparticle treatment for crack repair in concrete</td>
<td>Henry Cardenas</td>
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## Tuesday 23/8 2016

### Electrochemistry in civil engineering

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<td><strong>Session 1</strong>&lt;br&gt;08.30-10.00</td>
<td>Repair and maintenance (2)&lt;br&gt;Electrochemical chloride extraction: efficiency and side effects with different mineral admixtures&lt;br&gt;Corrosion processes and ECE treatment in a both carbonated and chlorinated reinforced concrete&lt;br&gt;Electrokinetic polymerization of polymethyl methacrylate in hardened cement paste</td>
<td>Sara Ramos&lt;br&gt;Yolaine Tissier&lt;br&gt;Henry Cardenas</td>
<td>Cátia Margo</td>
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**Location:** Building 116, room 44

**Coffee Break**<br>10.00-10.45

| **Session 2**<br>10.45-12.30 | Geotechnical applications | Electro-desalination of sandstone contaminated with sodium sulphate | Lisbeth M. Ottosen |
| Location: Building 116, room 44 | | Electro-desalination of glazed tile panels – discussion of possibilities | Celia Dias-Ferreira |
| Key note | | Using geoelectrical methods to assess corrosion of rebar and preferential flow paths in dams | André Revil |

| **Coffee Break**<br>10.00-10.45 | | | |

| **Session 3**<br>13.30-15.00 | Upgrading of waste to resource | Electrokinetics to modify volume change characteristics of expansive soils: a laboratory based investigation | Samudra Jayasekera |
| Location: Building 116, room 44 | | Changes in electrical resistivity used as monitoring tool during the electrokinetic treatment of clayey soils | Vikas Gingine |
| | | Replacement of 5% of OPC by fly ash and APC residues from MSWI with electrodialytic pre-treatment | Cátia Magro |

| **Coffee Break**<br>15.00-15.30 | | | |

| **Session 4**<br>15.30-16.30 | Incorporation of treated straw and wood fly ash into clay building brick | Wan Chen |
| Location: Building 116, room 44 | Remediation of As contaminated soil - comparision of two different electrodialytic cells and applicability of treated soil in brick materials | Ana Rita Ferreira |

| **Conference Dinner**<br>17.30-22.00 | | | |
### MSSCE 2016 – Segment Programme

**Monday 22/8 2016**

**Moisture in Materials and Structures**

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<td><strong>Session 1</strong>&lt;br&gt;08.30-10.15</td>
<td><strong>Practice and field investigations I</strong>&lt;br&gt;Location: Building 116 Room 13</td>
<td>Investigation methodology for moisture damages</td>
<td>Lars-Olof Nilsson <em>(Invited)</em>&lt;br&gt;08.30-09.05</td>
<td>Kurt Kielsgaard Hansen</td>
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<td>A case of peeling</td>
<td>Anders Nielsen&lt;br&gt;09.05-09.25</td>
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<td>Magnesium-oxide boards cause moisture damage inside facades in new Danish buildings</td>
<td>Tommy Bunch-Nielsen&lt;br&gt;09.25-09.45</td>
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<td>Deterioration of concrete structures due to salt crystallization; influence of salt types and relative humidity</td>
<td>Samindi Samarakoon&lt;br&gt;09.45-10.05</td>
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<td><strong>Session 2</strong>&lt;br&gt;10.45-12.30</td>
<td><strong>Practice and field investigations II</strong>&lt;br&gt;Location: Building 116 Room 13</td>
<td>Full scale laboratory test building for examining moisture penetration through different ceilings</td>
<td>Thor Hansen&lt;br&gt;10.45-11.05</td>
<td>Elisa Franzoni</td>
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<td>Experiences with hydrophobic impregnations in repair-measures</td>
<td>Christoph Gehlen&lt;br&gt;11.05-11.25</td>
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<td>Conservation of the Danube spring zodiac reliefs based on continuous structural health monitoring</td>
<td>Frank Lehmann&lt;br&gt;11.25-11.45</td>
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<td>The hygrothermal performance of a neolithic passage grave</td>
<td>Poul Klenz Larsen&lt;br&gt;11.45-12.05</td>
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<tr>
<td><strong>Session 3</strong>&lt;br&gt;13.30-15.00</td>
<td><strong>Modelling and analytical assessment methods I</strong>&lt;br&gt;Location: Building 116 Room 13</td>
<td>New requirements on simulation tools for building energy performance evaluation</td>
<td>John Grunewald <em>(Invited)</em>&lt;br&gt;13.30-14.05</td>
<td>Carsten Rode</td>
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<td>Numerical simulation of humidity fields in concrete considering the model code formulation</td>
<td>Miguel Azenha&lt;br&gt;14.05-14.25</td>
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<td>Quantification of time-dependent moisture distributions in cement-based materials</td>
<td>Peng Zhang&lt;br&gt;14.25-14.45</td>
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<td>Modelling and analytical assessment methods II</td>
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<td>Location:</td>
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<td>Numerical analysis of salt crystallization in non-isothermal moist</td>
<td>Dariusz Gawin</td>
<td>Oliver Weichold</td>
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<td>porous materials</td>
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<td>Sensivity analysis of moisture transport models in the framework of</td>
<td>Sylvain Pradelle</td>
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<td>a reliability approach</td>
<td>15.50-16.10</td>
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<td>Comparison of artificial neural networks and response surface</td>
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<td>methodology in stone mastic asphalt using waste granite filler</td>
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<td>18.00-19.00</td>
<td>Pancake reception at the Copenhagen City Hall</td>
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# Tuesday 23/8 2016

## Moisture in Materials and Structures

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<td>Experimental methods I</td>
<td>Study of hygrothermal behavior of very hygroscopic insulation&lt;br&gt;Electrical investigations for moisture assessment on civil engineering structures&lt;br&gt;Gas permeability and electrical resistivity of structural concretes: impact of pore saturation&lt;br&gt;In situ concrete moisture measurement using gas permeability</td>
<td>Abdelkrim Trabelsi (Invited)&lt;br&gt;Jean-François Lataste&lt;br&gt;Kefei Li&lt;br&gt;Franck Agostini</td>
<td>Charlotte Thiel</td>
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<tr>
<td><strong>Session 2</strong>&lt;br&gt;10.45-12.30</td>
<td>Experimental methods II</td>
<td>Non-destructive measurements of $^1$H, $^{23}$Na and $^{35}$Cl profiles in building materials with NMR&lt;br&gt;Non-destructive moisture measurement in building materials using single-sided nuclear magnetic resonance&lt;br&gt;Investigating the role of moisture on concrete carbonation using single-sided $^1$H-NMR&lt;br&gt;Laboratory models for the assessment of the effectiveness of chemical damp-proofing in masonry: existing methods and some proposals for new fixtures</td>
<td>Leo Pel&lt;br&gt;Oliver Weichold&lt;br&gt;Charlotte Thiel&lt;br&gt;Elisa Franzoni</td>
<td>Lars-Olof Nilsson&lt;br&gt;</td>
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<td><strong>Session 3</strong>&lt;br&gt;13.30-15.00</td>
<td>Other materials than cementitious materials I</td>
<td>Non-destructive wood moisture content measurements using computed tomography scanning&lt;br&gt;Analysis of wood and biomaterials by dynamic vapor sorption technique&lt;br&gt;Moisture transport properties of brick – comparison of exposed, impregnated and rendered brick</td>
<td>Owe Lindgren&lt;br&gt;Damiano Cattaneo&lt;br&gt;Ruut Hannele Peuhkuri</td>
<td>Jean-François Lataste&lt;br&gt;</td>
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<td><strong>Session 4</strong>&lt;br&gt;<strong>Location:</strong> Building 116 Room 13&lt;br&gt;&lt;br&gt;<strong>Other materials than cementitious materials II</strong>&lt;br&gt;<strong>On the improvement of hygroscopic capacity of clay based materials</strong>&lt;br&gt;Presenter: Lorena Freitas Dutra&lt;br&gt;Chairman: Franck Agostini&lt;br&gt;&lt;br&gt;<strong>Hygrothermal behaviour of hollow and filled ceramic masonry blocks</strong>&lt;br&gt;Presenter: Balázs Nagy&lt;br&gt;&lt;br&gt;<strong>The differences in water absorption rates of external thermal insulation composite system</strong>&lt;br&gt;Presenter: Edita Smetonaite&lt;br&gt;&lt;br&gt;<strong>Discussion</strong>&lt;br&gt;16.30-17.00</td>
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**Wednesday 24/8 2016**

**Moisture in Materials and Structures**

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<td>Other materials than cementitious materials III</td>
<td>Effect of moisture on tuff stone degradation</td>
<td>Barbara Lubelli 08.30-08.50</td>
<td>Markus Krüger</td>
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<td><strong>Location:</strong> Building 116 Room 13</td>
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<td>Phenomenologic analysis on the moisture flux through cracks in masonry</td>
<td>Klaas Calle 08.50-09.10</td>
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<td>Cementitious materials I</td>
<td>Monitoring and simulating humidity profiles in concrete elements during drying</td>
<td>Miguel Azenha 09.10-09.30</td>
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<td>Drying of cement-based porous materials: a fractional kinetic approach</td>
<td>Qiang Zeng 09.30-09.50</td>
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<td>Discussion</td>
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<td><strong>Coffee Break</strong> 10.15-10.45</td>
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<td><strong>Session 2</strong> 10.45-12.30</td>
<td>Cementitious materials II</td>
<td>Water absorption into white cement mortars by capillarity</td>
<td>Chunsheng Zhou 10.45-11.05</td>
<td>Miguel Azenha</td>
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<td><strong>Location:</strong> Building 116 Room 13</td>
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<td>Prediction of permeability from water vapor sorption isotherm of cement-based materials</td>
<td>Dongdong Zhang 11.05-11.25</td>
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<td>Electrical behavior of hardened cement paste at radio frequency under various moisture saturation degrees</td>
<td>Gopinandan Dey 11.25-11.45</td>
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<td>Calibration samples for the measurement of moisture content in concrete</td>
<td>Miguel-Ángel Climent 11.45-12.05</td>
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<td><strong>Session 3</strong> 13.30-15.00</td>
<td>Cementitious materials III</td>
<td>Development of interior relative humidity due to self-desiccation in blended cementitious system</td>
<td>Guang Ye 13.30-13.50</td>
<td>Christoph Gehlen</td>
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<tr>
<td><strong>Location:</strong> Building 116 Room 13</td>
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<td>Potential of moisture dry-out from concrete wall in estonian climate</td>
<td>Peep Pihelo 13.50-14.10</td>
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<td>Discussion</td>
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<td>14.10-15.00</td>
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## MSSCE 2016 – Segment Programme

### Monday 22/8 2016

**Concrete with Supplementary Cementitious Materials**

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<td>Characterization and Mix Design</td>
<td>Maria Juenger</td>
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<td><strong>Location:</strong> Building 116 Aud-83</td>
<td>Welcome and Introduction on TC-SCM Presenter: Nele De Belie</td>
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<td></td>
<td>Particle Size Distribution and Specific Surface Area of SCM’s compared through Experimental Techniques Presenters: Natalia M. Alderete, Yury A. Villagrán Zaccardi, Gabriela S. Coelho Dos Santos, Nele de Belie</td>
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<td></td>
<td>Effect of Testing Conditions on the Loss on Ignition Results of Anhydrous Granulated Blast Furnace Slags determined via Thermogravimetry Presenters: Susan A. Bernal, Xinyuan Ke, Oday H. Hussein, John L. Provis</td>
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<td>Supplementary Cementitious Materials in the Era of Sustainable Concrete Presenters: Vyacheslav Falikman, Nikolai Bashlykov</td>
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<td>Reaction Products and Microstructure</td>
<td>Barbara Lothenbach</td>
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<td><strong>Location:</strong> Building 116 Aud-83</td>
<td>Effect of Fly Ash on Pore Structure of Hardened Cement Paste measured by Thermoporometry Kiyofumi Kurumisawa, Takya Sugiyama, Masanori Miyamoto, Presenters: Toyoharu Nawa</td>
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<td>Effects of W/P Ratio and Limestone Filler on Permeability of Cement Pastes Presenters: Quoc Tri Phung, Norbert Maes, Diederik Jacques, Geert De Schutter, Guang Ye</td>
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<td>Physical and Mechanical Properties of Cement Mortars with Biomass Ashes as SCM Presenters: Mirjana Malešev, Vlastimir Radonjanin, Miroslava Radeka, Slobodan Šupić, Suzana Draganić</td>
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<td>Influence of SCM on Pore Solution Composition Presenters: Anya Vollpracht, Barbara Lothenbach, Ruben Snellings, Johannes Haufe</td>
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<td>Applicability of Nordic Clays as SCM Presenters: Harald Justnes, Tone Anita Østnor, Serina Ng</td>
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<td>Alkali Activation</td>
<td>Susan Bernal</td>
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<td><strong>Location:</strong> Building 116 Aud-83</td>
<td>Physical Properties and Pore Solution Analysis of Alkali Activated Fly Ash-Slag Pastes Presenters: Marija Nedeljković, Kamel Arbi, Yibing Zuo, and Guang Ye</td>
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<td>Investigation of The Moisture Influence on Permeation Properties of Alkali-Activated Slag Concrete Presenters: Kai Yang, Sreejith Nanukuttan, Changhui Yang, Bryan Magee, Jianxiong Ye, Muhammed Basheer</td>
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<td><strong>Session 1</strong>&lt;br&gt;08.30-10.15&lt;br&gt;Location: Building 116 Aud-83</td>
<td>COST NORM4Building&lt;br&gt;Novel Cementing Binders and Norms&lt;br&gt;Presenters: John Provis (invited speaker)</td>
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<td>Production of Ceramics using Bottom Ash and Fly Ash from a Thermal Power Plant&lt;br&gt;Presenters: Biljana Angjusheva, Emilija Fidancevska, Vilma Ducman, Ljubica Vladičevska</td>
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<td>Sintering of Ceramics based on Mechanically Activated Fly Ash&lt;br&gt;Presenters: Emilija Fidancevska, Jörg Bossert, Biljana Angjusheva, Vojo Jovanov, Vineta Srebrenkoska</td>
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<td>High Volume Fly Ash Hybrid Alkali Activated Cements and Concretes for Indoor Application&lt;br&gt;Presenters: Pavel Krivenko, Oleksandr Kovalchuk, Valentina Grabovčuk</td>
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<td>Radiological Study of Cements and Geopolymers&lt;br&gt;Presenters: Francisca Puertas, Catalina Gascó, Luis Yagüe, Nuria Navarro, José Antonio Suárez, María del Mar Alonso, Manuel Torres-Carrasco, Patricia Rivilla</td>
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<td>Reaction Kinetics (Part 2)&lt;br&gt;Outcome of the RILEM Robin on Degree of Reaction of Slag and Fly Ash in Composite Cements&lt;br&gt;Presenters: Pawel T. Durdziński, Mohsen Ben Haha, Susan A. Bernal, Nele De Belie, Elke Gruyaert, Barbara Lothenbach, John L. Provis, Axel Schöler, Christopher Stabler, Zhijun Tan, Anya Vollpracht, Frank Winnefeld, Yury Villagrán Zaccardi, Maciej Zając, Karen L. Scrivener</td>
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<td>Reactivity of Fly Ash in the Presence of Chemical Activators&lt;br&gt;Presenters: Frank Winnefeld, Salaheddine Alahrache, Jean-Baptiste Champenois, Frank Hesselbarth, Barbara Lothenbach</td>
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<td>Session 3 13.30-15.00</td>
<td>Properties of Concrete with SCMs (Part 1)</td>
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<td>Coal Bottom Ash Feasibility Study to be a New Portland Cement Constituent</td>
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<td>Investigation of the Effect of Partial Replacement of Portland Cement by Fly Ash on Carbonation using TGA and SEM-EDS</td>
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<td>Properties of Concrete with SCMs (Part 2)</td>
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<td>Realizing the Strengths of SCM Concretes by Recognizing Their Weaknesses</td>
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<td>The Effect of SCM Replacement on Autogenous Deformation of High Performance Concrete</td>
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<td>Eco-Concrete for Precast Elements with Effective Mineral Micro- and Eco-Fillers</td>
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<td>Replacement of Cement with Waste Ceramic Powder in Cementitious Composites: Results of a Preliminary Investigation</td>
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Wednesday 24/8 2016
Concrete with Supplementary Cementitious Materials

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<td><strong>Can Superabsorbent Polymers Mitigate Shrinkage in Cementitious Materials Blended with Supplementary Cementitious Materials?</strong></td>
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<td>**</td>
<td><strong>Presenters</strong>: Didier Snoeck, Ole Mejlhede Jensen, Nele De Belie</td>
<td><strong>Mitigation of Early Age Shrinkage in Selfconsolidating Paste Systems Using Superabsorbent Polymers</strong></td>
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<td><strong>Presenters</strong>: Syed Ali Rizwan, Shozab Mustafa, Waleed Ahmed</td>
<td><strong>Predictions of the Mechanical Performance of Concrete made with Ternary Cements</strong></td>
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<td><strong>Presenters</strong>: Kim-Séang Lauch, Vinciane Dieryck, Benoit Parmentier</td>
<td><strong>Comparison of the Expansion of Mortar Containing Shell Powder of Surf Clam and Scallop</strong></td>
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<td><strong>Presenters</strong>: Akio Watanabe, Kazumi Hirokawa, Takashi Kondo</td>
<td><strong>Performance of Alusilica as Mineral Admixture in Cementitious Systems</strong></td>
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<td><strong>Presenters</strong>: Lin Chi, Ole Mejlhede Jensen</td>
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<td><strong>RILEM week activities on SCMs (joint with the RILEM technical day)</strong></td>
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<td><strong>10.45 – 10.50 Welcome and brief introduction to RILEMs technical work</strong></td>
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<td>**</td>
<td><strong>10.50 – 11.20 TC-238-SCM Hydration and Microstructure of Concrete with Supplementary Cementitious Materials</strong></td>
<td><strong>10.50 – 11.20 TC-238-SCM Hydration and Microstructure of Concrete with Supplementary Cementitious Materials</strong></td>
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<td><strong>11.20 – 11.50 Advances in Near-Neutral Salts Activation of Blast Furnace Slags</strong></td>
<td><strong>11.20 – 11.50 Advances in Near-Neutral Salts Activation of Blast Furnace Slags</strong></td>
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<td><strong>11.50 – 12.20 Assessing, Understanding and Unlocking Supplementary Cementitious Materials</strong></td>
<td><strong>11.50 – 12.20 Assessing, Understanding and Unlocking Supplementary Cementitious Materials</strong></td>
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<td><strong>12.20 – 12.30 Gustavo Colonnetti Medal Hand-Over Ceremony</strong></td>
<td><strong>12.20 – 12.30 Gustavo Colonnetti Medal Hand-Over Ceremony</strong></td>
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<td><strong>Location:</strong></td>
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<td><strong>Carbonation Mechanism of Different Kinds of C-S-H: Rate and Products</strong></td>
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<td>**</td>
<td><strong>Presenters</strong>: Bei Wu, Guang Ye</td>
<td><strong>Chloride Penetration in Concrete under Compression or Splitting Tensile Load Representing 60-65 Percent of the Ultimate Load</strong></td>
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<td><strong>Presenters</strong>: Hugo Egüez Alava, Nele De Belie, Geert De Schutter</td>
<td><strong>Internal Curing of High Performance Concrete with Superabsorbent Polymers: Evaluation of Durability</strong></td>
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<td><strong>Presenters</strong>: Jennifer A. Canul-Polanco, Alejandro Durán-Herrera, Pedro L. Valdez-Tamez</td>
<td><strong>Durability of Concrete made with Ternary Cements Containing Slag or Fly Ash and Limestone Filler</strong></td>
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| Event         | Time          | Session 4 | Location: Building 116 Aud-83 | Durability of High Volume Fly Ash Concrete  
Presenters: Himabindu Myadaraboina, Mochamad Solikin, Indubhushan Patnaikuni | Permeability of Ambient Cured Fly Ash Geopolymer Concrete Blended With Additives  
Presenters: Pradip Nath, Prabir Kumar Sarker |
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<td>Session 4</td>
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<td>Durability (Part 3)</td>
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<td>Esperanza Menendez</td>
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## Session 2
10.45-12.30

**Location:** Building 116 room 17

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<td>WELCOME</td>
<td>Didier Snoeck Philip Van den Heede <strong>Nele De Belie</strong></td>
<td>R. Doug Hooton</td>
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<td>Session 2 10.45-12.30</td>
<td>Concrete mix design - SCMs - special types of concrete</td>
<td>Towards an adequate deicing salt scaling resistance of high-volume fly ash (HVFA) concrete and concrete with superabsorbent polymers (SAPs)</td>
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<td>The salt-frost resistance of concrete with supplementary cementitious materials (SCM)</td>
<td><strong>Elisabeth Helsing</strong> Peter Utgenannt</td>
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<td>Foam index measurements on mixes of air entraining agents, super plasticizers and fly ash-cement-filler blends</td>
<td><strong>Stefan Jacobsen</strong> Henrik Nordahl-Pedersen Hawar Omer Rasol Øyvind O. Lødemel Lori Tunstall George W. Scherer</td>
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<td>Deicer-salt scaling of concrete containing fly ash</td>
<td><strong>Michael Thomas</strong> Huang Yi</td>
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<td>Influence of ductility and microcracking on the frost durability of cementitious composites with high volumes of fly ash</td>
<td><strong>Gürkan Yıldırım</strong> Oğuzhan Öztürk Mustafa Şahmaran Mohamed Lachemi</td>
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<td>Air void structure</td>
<td>15.00-15.30</td>
<td>Combined action</td>
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<td>Correlation between characteristic distances of air voids as point processes and conventional spacing factors in mortars</td>
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<td>The influence of carbonation and age on salt frost scaling of concrete with mineral additions</td>
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<td>Hidefumi Koto Takuma Murotani Shin-Ichi Igarashi</td>
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<td>Ingemar Löfgren Oskar Esping Anders Lindvall</td>
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<td>The influence of air void characteristics on freeze-thaw-salt resistance of pavement concretes</td>
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<td>The use of image analysis to quantify the orientation of cracks in concrete</td>
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<td>Aljoša Šajna Lado Bras</td>
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<td>Einar N. Andreassen Andreas B. Elbønd Marianne T. Hasholt</td>
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<td>Methodology to analyse the salt frost scaling mechanism(s) in concrete with different binders</td>
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<td>Frost damage of concrete subject to confinement</td>
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<td>Martin Strand Katja Fridh</td>
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<td>Marianne T. Hasholt</td>
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<td>Linking surfactant molecular structure to mortar frost protection</td>
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<td>The influence of the freeze-thaw loading cycle on the ingress of chlorides in concrete</td>
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<td>Lori E. Tunstall George W. Scherer Robert K. Prud’Homme</td>
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<td>Miguel Ferreira Markku Leivo Hannele Kuosa David Lange</td>
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<td>Water penetration into frost damaged concrete</td>
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<td>Peng Zhang Yuan Cong Wanyu Zhao Wenchao Geng Zhengzheng Dai Tiejun Zhao</td>
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**Location:** Building 116 room 17
## Tuesday 23/8 2016

### Frost Action in Concrete

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| **Session 1**<br>08.30-10.15 | Frost damage - mechanism and modelling | Freezing induced stresses in concrete-steel composite beams and effect of air voids<br>
Modeling freezing of cementitious materials by considering process kinetics<br>
Experimental studies on frost-induced deterioration of concrete in Swedish hydroelectric structures<br>
Identification of optimal condition for the de-icing salt scaling resistance of concrete<br>
Mitigation of deicer damage in concrete pavements caused by calcium oxychloride formation – Use of ground lightweight aggregates | Stefan Jacobsen<br>George W. Scherer<br>Francesco Pesavento<br>Dariusz Gawin<br>Martin Rosenqvist<br>Katja Fridh<br>Manouchehr Hassanzadeh<br>Samindi Samarakoon<br>Samdar Kakay<br>Pål Lieske Tefre<br>Mats Buøen<br>Vikrant Kaushal<br>Prannoy Suraneni<br>Naomi Salgado<br>Hunter Carolan<br>Chang Li<br>Vahid Jafari Azad<br>O. Burkan Isgor<br>Jason H. Ideker<br>Jason Weiss | Marianne Tange Hasholt |
| **Location:** Building 116 room 17 | | | |
| **Coffee Break**<br>10.15-10.45 | Measuring techniques and monitoring. Experience from field | Non-destructive evaluation of concrete subjected to freeze-thaw cycles<br>
Percolation in cementitious materials under freeze-thaw cycles investigated by means of electrical resistivity<br>
Frost resistance of concrete – Experience from long term field exposure<br>
Freeze-Thaw-Attack on concrete structures – laboratory tests, monitoring, practical experience<br>
Application of air entrained concrete in tollways constructions in Liaoning Province of China | Sofia Aparicio<br>Javier Ranz<br>Margarita G. Hernández<br>José Javier Anaya Velayos<br>Zhendi Wang<br>Ling Wang<br>Yan Yao<br>Dimitrios Boubitsas<br>Peter Utgenannt<br>Luping Tang<br>Elisabeth Helsing<br>Frank Spörel<br>Wencui Yang<br>Xiaoping Cai<br>Yong Ge<br>Jie Yuan | Katja Fridh |
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<td><strong>Final discussion</strong></td>
<td>INTRODUCTION TO DISCUSSION CEN Freeze-thaw testing – Status and deficiencies (approach, acceptance criteria, methodology &amp; research needs)</td>
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<td>DISCUSSION: Future research related to concrete frost resistance</td>
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<td>CLOSURE</td>
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<td>Terje F. Rønning</td>
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<td>R. Doug Hooton</td>
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# MSSCE 2016 – Segment Programme

**Monday 22/8 2016**

**Fresh Concrete**

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<td>08.45-09.00</td>
<td>Welcome</td>
<td>Welcome</td>
<td>Lars Nyholm Thrane</td>
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<td><strong>Location:</strong> Building 116, Room No 19</td>
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<tr>
<td><strong>Session 1</strong></td>
<td>Mix design</td>
<td>Particle size distribution of supplementary cementitious materials and crushed sand fines: perspectives for micro-proportioning</td>
<td>Rolands Cepuritis</td>
<td>Lars Nyholm Thrane</td>
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<tr>
<td>09.00-10.15</td>
<td></td>
<td>Calcareous fly ash as component of self compacting concrete</td>
<td>Jacek Gołaszewski</td>
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<td></td>
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<td>A modified mixed design method of concrete made with crushed brick aggregate</td>
<td>Joyanta Pal</td>
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<td><strong>Coffee Break</strong></td>
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<td>10.15-10.45</td>
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<tr>
<td><strong>Session 2</strong></td>
<td>Mix design</td>
<td>Quantification of the shape of particles for calculating specific surface area of powders</td>
<td>Yahya Ghasemi</td>
<td>Claus Vestergaard Nielsen</td>
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<tr>
<td>10.45-12.30</td>
<td></td>
<td>Computer aided mix design approach predicting concrete workability properties</td>
<td>Annika Gram</td>
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<td>Extrusion of wood mortars: a process for optimizing their formulation and mechanical properties</td>
<td>Jean Gerard Ndong Engone</td>
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<td>Assessment of value stream of formwork preparation process in prefabricating reinforced concrete elements</td>
<td>Tor Gunnar Vilke</td>
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<td><strong>Lunch Break</strong></td>
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<td>12.30-13.30</td>
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<td>Session</td>
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<tr>
<td><strong>Session 3</strong>  &lt;br&gt;13.30-15.00  &lt;br&gt;Location: Building 116, Room No 19</td>
<td>Early age concrete  &lt;br&gt;Practical experiences with early-age modelling of concrete properties</td>
<td>Claus Vestergaard Nielsen</td>
<td>Mohammed Sonebi</td>
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<td></td>
<td>Establishing the curing procedure for precast RC members by early age simulations</td>
<td>Yilmaz Akkaya</td>
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<td>Examining hydration kinetics obtained from different mixing procedures using isothermal calorimetry</td>
<td>Oskar Linderoth</td>
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<td>Acoustic emission monitoring of fresh cementitious material</td>
<td>Evin Dildar A Dzaye</td>
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<td><strong>Coffee Break</strong>  &lt;br&gt;15.00-15.30</td>
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<tr>
<td><strong>Session 4</strong>  &lt;br&gt;15.30-16.30  &lt;br&gt;Location: Building 116, Room No 19</td>
<td>Numerical simulations of flow  &lt;br&gt;Numerical simulation of SCC casting: parameter determination</td>
<td>Ksenija Vasilic</td>
<td>Annika Gram</td>
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<td>OpenFOAM casting solver with segregation</td>
<td>Jon Elvar Wallevik</td>
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<td>Extrusion of semi-solid fibre-cement composites: process simulation and extruder design</td>
<td>Xiangming Zhou</td>
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<tr>
<td><strong>Session 5</strong>  &lt;br&gt;16.30-17.00  &lt;br&gt;Location: Building 116, Room No 19</td>
<td>Keynote lecture</td>
<td>High-Performance Concrete with Adapted Rheology</td>
<td>Kamal Khayat</td>
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</table>
## Tuesday 23/8 2016

### Fresh Concrete

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Paper</th>
<th>Presenter</th>
<th>Chairman</th>
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</thead>
<tbody>
<tr>
<td><strong>Session 1</strong></td>
<td>08.30-10.15</td>
<td>Rheology</td>
<td>Ivan Paric</td>
<td>Jon Elvar Wallevik</td>
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<tr>
<td><strong>Location:</strong></td>
<td>Building 116, Room No 19</td>
<td>The realtime assessment of the rheological parameters of SCC</td>
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<td></td>
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<td>Rheology as tool to master fresh properties of concretes</td>
<td>Violeta Bokan Bosiljkov</td>
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<td>The use of rheology in the selection of concrete with low environmental impact</td>
<td>Claus Pade</td>
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<td>Use of thixotropy model to capture competition between paste deflocculation and sand particle migration</td>
<td>Shiho Kawashima</td>
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<td><strong>Coffee Break</strong></td>
<td>10.15-10.45</td>
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<tr>
<td><strong>Session 2</strong></td>
<td>10.45-12.00</td>
<td>Numerical simulations of flow</td>
<td>Jon Elvar Wallevik</td>
<td>Oldrich Svec</td>
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<tr>
<td><strong>Location:</strong></td>
<td>Building 116, Room No 19</td>
<td>Concrete truck mixer as a rheometer – computational analysis using openFOAM</td>
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<td>Simulating mixing processes of cementitious materials with water using DEM</td>
<td>Knut Krenzer</td>
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<td>Casting of T-beam using the PFI material model – influence of thixotropy and structural breakdown</td>
<td>Jon Elvar Wallevik</td>
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</tr>
<tr>
<td><strong>Session 3</strong></td>
<td>12.00-12.30</td>
<td>Keynote lecture and Closing session</td>
<td>Nicolas Roussel</td>
<td>Lars Nyholm Thrane</td>
</tr>
<tr>
<td><strong>Location:</strong></td>
<td>Building 116, Room No 19</td>
<td>Fresh and early age concrete – Future R&amp;D trends</td>
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<td><strong>Lunch Break</strong></td>
<td>12.30-13.30</td>
<td>Conference Dinner</td>
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<td>17.30-22.00</td>
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</table>
## MSSCE 2016 – Segment Programme

**Wednesday 24/8 2016**

**Cold Region Engineering**

<table>
<thead>
<tr>
<th>Session</th>
<th>Paper</th>
<th>Presenter</th>
<th>Chairman</th>
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</thead>
<tbody>
<tr>
<td><strong>Session 1</strong>&lt;br&gt;08.30-10.15&lt;br&gt;<em>Location: Building 118, room 49</em></td>
<td>Structures</td>
<td>Welcome</td>
<td>Lisbeth M. Ottosen</td>
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<td>Investigating the influence of cold climate conditions on structural dynamics</td>
<td>Holger Koss</td>
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<td>Snowdrift – visualisation on an architectural model in wind tunnel testing</td>
<td>Jennifer Fiebig</td>
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<td></td>
<td>Natural energy efficiency and sustainability (NEES) in design and construction in the northern and arctic periphery of Europe</td>
<td>Mohamad Y. Mustafa</td>
</tr>
<tr>
<td><strong>Coffee Break</strong>&lt;br&gt;10.15-10.45</td>
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</tr>
<tr>
<td><strong>Session 2</strong>&lt;br&gt;10.45-12.30&lt;br&gt;<em>Location: Building 118, room 49</em></td>
<td>Construction materials</td>
<td>Lightness in the Extreme: Cases of Lightweight Constructions in Polar Environments</td>
<td>Jessica Bak</td>
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<td>Evaluation of the potential for using Greenlandic marine sediments for brick production</td>
<td>Ida Maria Gieysztor Bertelsen</td>
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<td>Pre-dispersive technology and fabrication of composite insulation board made with brucite and chrysotile fibers</td>
<td>Shuang Lu, Ping Yu, Zheng Wang</td>
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<tr>
<td><strong>Lunch Break</strong>&lt;br&gt;12.30-13.30</td>
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<tr>
<td><strong>Session 3</strong>&lt;br&gt;13.30-15.00&lt;br&gt;<em>Location: Building 118, room 49</em></td>
<td>Engineering properties of fibres from waste fishing nets</td>
<td>Ida Maria Gieysztor Bertelsen</td>
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<td>Recycled fishing nets as reinforcement of existing concrete structures</td>
<td>Amanda Helena Bonnerup, Nina Marie Sigvardsen</td>
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<td>Characterization of particulate residues from Greenlandic MSWI for use as secondary resources</td>
<td>Gunvor Marie Kirkelund</td>
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<tr>
<td><strong>Coffee Break</strong>&lt;br&gt;15.00-15.30</td>
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<tr>
<td><strong>Session 4</strong>&lt;br&gt;15.30-17.00&lt;br&gt;<em>Building 118, room 49</em></td>
<td>Environmental Technology</td>
<td>Polluted sediments in arctic harbors and electrodialytic remediation</td>
<td>Kristine Bondo Pedersen</td>
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<td></td>
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<td>Potentials and challenges of biogas from fish industry waste in the arctic</td>
<td>Pernille Erland Jensen</td>
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<td></td>
<td>A generic system for the selection and accreditation of best practices based on natural energy efficiency and sustainability in buildings</td>
<td>Mohamad Y. Mustafa</td>
</tr>
</tbody>
</table>
# MSSCE 2016 – Segment Programme

## Monday 22/8 2016

**Building Information Modelling in Civil Engineering**  
- **Open BIM in Education**

<table>
<thead>
<tr>
<th>Session</th>
<th>Paper</th>
<th>Presenter</th>
<th>Chairman</th>
</tr>
</thead>
</table>
| **Session 1**  
08.30-10.15  
*Location:* Building 116 Room 18-20 | Keynotes  
Introduction  
Status and a vision of open BIM in architectural and engineering education in UK  
Open BIM in education in Norway | Jan Karlshøj  
Arto Kiviniemi  
Eilif Hjelseth | Jan Karlshøj |
| **Coffee Break**  
10.15-10.45 | | | |
| **Session 2**  
10.45-12.30  
*Location:* Building 116 Room 18-20 | Open BIM in education  
A case study of BIM education in residential construction  
BIM in engineering education – experiences with implementation in new and existing educations  
Open BIM in courses in engineering education | Carol Hon  
Kjeld Svidt  
Flemming Vestergaard | Jan Karlshøj |
| **Lunch Break**  
12.30-13.30 | | | |
| **Session 3**  
13.30-15.00  
*Location:* Building 116 Room 18-20 | Open BIM in engineering design  
Open BIM in course on advanced building design  
Green BIM – eco friendly sustainable design with building information modelling  
Automated rule – based checking of level of development (LOD) | Jan Karlshøj  
Eilif Hjelseth  
Nuthan Dummenahally  
Stavros Moiragias | Eilif Hjelseth |
| **Coffee Break**  
15.00-15.30 | | | |
| **Session 4**  
15.30-17.00  
*Location:* Building 116 Room 18-20 | Open BIM in engineering design  
The BCF format as a mediator for task management in building design  
Development of IFC based fire safety assessment tools  
Information exchange structures for early-stage Building Performance Simulation | Hussain Parsianfar  
Arto Kiviniemi  
Jan Karlshøj  
Thomas Fænø Mondrup | Arto Kiviniemi |
Tuesday 23/8 2016

Building Information Modelling in Civil Engineering
- Open BIM in Education

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<tr>
<th>Session</th>
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<th>Chairman</th>
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<tbody>
<tr>
<td><strong>Session 1</strong>&lt;br&gt;08.30-10.15</td>
<td>Advanced courses in open BIM</td>
<td>Cluster project at Technical University of Denmark – presentation only</td>
<td>Jan Karlshøj</td>
</tr>
<tr>
<td><strong>Location:</strong> Building 116 Room 18-20</td>
<td>PhD course on Process and Data Modeling for the Built Environment – presentation only</td>
<td>Jan Karlshøj</td>
<td>Flemming Vestergaard</td>
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<tr>
<td><strong>Coffee Break</strong>&lt;br&gt;10.15-10.45</td>
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<tr>
<td><strong>Session 2</strong>&lt;br&gt;10.45-12.30</td>
<td>Workshop: Educational needs in generate requirements</td>
<td>IDM methodology</td>
<td>Moderator Jan Karlshøj</td>
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<tr>
<td><strong>Location:</strong> Building 116 Room 18-20</td>
<td>Client’s needs</td>
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<td>Discussion</td>
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<td>Educational aspects</td>
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<td><strong>Lunch Break</strong>&lt;br&gt;12.30-13.30</td>
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<tr>
<td><strong>Session 3</strong>&lt;br&gt;13.30-15.00</td>
<td>Workshop: Research topics and methodologies</td>
<td>Research topics</td>
<td>Moderator Eilif Hjelseth</td>
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<tr>
<td><strong>Location:</strong> Building 116 Room 18-20</td>
<td>Research methodologies</td>
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<td>Researching in practice</td>
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<td>Summary</td>
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<td><strong>Coffee Break</strong>&lt;br&gt;15.00-15.30</td>
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<tr>
<td><strong>Session 4</strong>&lt;br&gt;15.30-17.00</td>
<td>Workshop: Open BIM curriculum</td>
<td>Process flow and standards</td>
<td>Moderator Jan Karlshøj</td>
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<tr>
<td><strong>Location:</strong> Building 116 Room 18-20</td>
<td>Data formats, data models and communication</td>
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<td>Collaboration and social science</td>
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<td>Sharing teaching material and exercises</td>
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<tr>
<td><strong>Conference Dinner</strong>&lt;br&gt;17.30-22.00</td>
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## MSSCE 2016 – Segment Programme

### Monday 22/8 2016

Building Materials and Indoor Environment

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<th>Session 1</th>
<th>08.30-10.15</th>
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<td><strong>Coffee Break</strong></td>
<td>10.15-10.45</td>
<td>No sessions</td>
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<tr>
<td>Session 2</td>
<td>10.45-12.30</td>
<td>No sessions</td>
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<tr>
<td><strong>Lunch Break</strong></td>
<td>12.30-13.30</td>
<td>Coffee Break</td>
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### Session 3
**Location:** Building 116 Room 42

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30-13:50</td>
<td>Trends in European Labelling</td>
<td>Thomas Witterseh</td>
<td>Danish Technological Institute</td>
</tr>
<tr>
<td>13:50-14:20</td>
<td>Methods for emission testing of construction products – volatile compounds and sensory evaluation</td>
<td>Helene Klinke</td>
<td>Danish Technological Institute</td>
</tr>
<tr>
<td>14:20-14:40</td>
<td>EU-LCI values and emission classes for evaluation of emissions</td>
<td>Thomas Witterseh</td>
<td>Danish Technological Institute</td>
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<tr>
<td>14:40-15:00</td>
<td>Discussion and sharing of experiences</td>
<td>All participants</td>
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### Session 4
**Location:** Building 116 Room 42

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>15:30-15:45</td>
<td>The PCB problem indoors</td>
<td>Barbara Kolarik</td>
<td>SBI, Aalborg University</td>
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<tr>
<td>15:45-16:00</td>
<td>Health effects of indoor PCB exposure</td>
<td>Allan Astrup Jensen</td>
<td>Nordic Institute of Sustainability, Environmental Chemistry and Toxicology</td>
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<tr>
<td>16:00-16:15</td>
<td>Mitigation in practice – a case story</td>
<td>Marie Frederiksen</td>
<td>SBI, Aalborg University</td>
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<tr>
<td>16:15-16:30</td>
<td>Assessment of PCB in buildings</td>
<td>Helle Vibeke Andersen</td>
<td>SBI, Aalborg University</td>
</tr>
<tr>
<td>16:30-16:45</td>
<td>Are there any shortcuts in mitigation of PCB in buildings?</td>
<td>Lars Gunnarsen</td>
<td>SBI, Aalborg University</td>
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<tr>
<td>16:45-17:00</td>
<td>Sharing of experiences with PCB in buildings and discussion of findings</td>
<td>All participants</td>
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</table>
Everyone is welcome to participate in the RILEM Technical day on Wednesday 24/08/16 from 10.15 until 15.00.

Draft program for the RILEM Technical day Wednesday 24th 2016

10:15-10:45
Coffee break

10:45-10:50
Welcome and brief introduction to RILEMs technical work, TAC chair Nicolas Roussel

10:50-11:20
TC-238-SCM Hydration and microstructure of concrete with supplementary cementitious materials, Chaired by Nele De Belie

11:20-11:50
Gustavo Colonnetti medalist Susan Bernal « Advances in near-neutral salts activation of blast furnace slags »

11:50-12:20
Gustavo Colonnetti medalist Ruben Snellings « Assessing, Understanding and Unlocking Supplementary Cementitious Materials »

12:20-12:30
Gustavo Colonnetti medal hand-over ceremony, Nicolas Roussel

12:30-13:30
Lunch

13:30-14:00
TC-248-MMB Methods of measuring moisture in building materials and structures, chaired by Lars-Olof Nilsson

14:00-14:30
TC-246-TDC Test methods to determine durability of concrete under combined environmental actions and mechanicalload, chaired by Yan Yao, presented by Prof. Dr. Juan LI from China Building Materials Academy

14:30-15:00
TC-230-PSC Performance-based specifications and control of concrete durability, chaired by Hans D. Beushausen

15:00-15:30
Coffee break
### Core Group Meeting draft programme - 22/08/2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14.00 – 15.00</td>
<td>Core Group Meeting  <em>(building 116: room 45)</em></td>
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<tr>
<td>15.00 – 15.30</td>
<td>Coffee break</td>
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<tr>
<td>15.30 – 17.00</td>
<td>Core Group Meeting  <em>(building 116: room 45)</em></td>
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<tr>
<td>17.00 – 19.00</td>
<td>Pancake reception at the Copenhagen City Hall</td>
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### Workshop – Round Table – MC Meeting draft programme – 23/08/2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08.15 – 08.30</td>
<td>Registration and signing attendance list</td>
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<tr>
<td>08.30 – 10.15</td>
<td>COST NORM4Building – SCM session “Supplementary cementitious materials &amp; NORMs” <em>(building 116: auditorium 83)</em></td>
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<td></td>
<td>• 8.30-9.00 (invited speaker) ‘Novel cementing binders and NORMs’ <em>(John Provis)</em></td>
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<td>• 9.00-9.15 Production of ceramics using bottom ash and fly ash from a thermal power plant <em>(Biljana Angjusheva, Emilija Fidancevska, Vilma Ducman and Ljubica Vladianova)</em></td>
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<td>• 9.15-9.30 Sintering of ceramics based on mechanically activated fly ash <em>(Emilija Fidanchevski, Jorg Bossert, Biljana Angjusheva, Vojo Jovanov and Vineta Srebrenkoska)</em></td>
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<td>• 9.30-9.45 Pavel Krivenko, Oleksandr Kovalchuk and Valentina Grabovchuk High volume fly ash alkali activated cements and concretes for indoor application</td>
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<td>• 9.45-10.00 Radiological study of cements and geopolymers <em>(Francisca Puertas, Catalina Gasco, Luis Yague, Nuria Navarro, Jose Antonio Suarez, Mar Alonso, Manuel Torres and Patricia Rivilla)</em></td>
</tr>
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<td>• 10.00- 10.15 Discussion</td>
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<tr>
<td>10.15 – 10.45</td>
<td>Coffee break <em>(change to room 42)</em></td>
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<tr>
<td>10.45 – 12.30</td>
<td>COST NORM4Building session “Radiological effluents from construction materials that influence the (indoor) environment” <em>(building 116: room 42)</em></td>
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<td>• 10.45-11.15 ‘Current status of the implementation of the EU-BSS: radiological guidelines for the building materials of tomorrow.’ <em>(Rob Wiegers)</em></td>
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<td>• 11.15-11.45 Should natural radioactivity in construction materials be considered in an environmental impact assessment? <em>(Rainer)</em></td>
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### NORM Association Meeting + WG Meeting draft programme – 24/08/2016

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<th>Time</th>
<th>Event</th>
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<tr>
<td>09.00 – 10.15</td>
<td>NORM Association Meeting</td>
<td>building 116: room 45</td>
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<td>10.45 – 12.30</td>
<td>NORM Association Meeting</td>
<td>building 116: room 45</td>
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<td>12.30 – 13.30</td>
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<tr>
<td>13.30 – 15.00</td>
<td>WG Meeting</td>
<td>building 116: room 42 – room 44 – room 45</td>
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<tr>
<td>15.30 – 17.00</td>
<td>WG Meeting</td>
<td>building 116: room 42 – room 44 – room 45</td>
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<tr>
<td>18.30 – 22.00</td>
<td>Dinner with COST members in Copenhagen City</td>
<td>Ristorante Italiano</td>
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</table>

### Agenda

- **Gellermann, Chr. Ahrens**
  
  - 11.45 – 12.15 Studying the impact of NORM containing construction materials on the environment. (Hildegarde Vandenhove, Nathalie Vanhoudt, Nathalie Impens)
  
  - 12.15-12.30 Building a European NORM association to support the safe reuse of NORM in Europe (Christian Kunze)

### Lunch and Coffee Breaks

- **12.30 – 13.30** LUNCH
- **15.00 – 15.30** Coffee break (change to building 101)

### Dinner with COST members

- **18.30 – 22.00** Dinner with COST members in Copenhagen City
  
  **The Olive KITCHEN & BAR**
  
  Nørregade 22, 1165 Copenhagen
  
  [www.theolive.dk](http://www.theolive.dk) / [info@theolive.dk](mailto:info@theolive.dk)

- **18.30 – 22.00** Dinner with COST members in Copenhagen City
  
  **Ristorante Italiano**
  
  Fiolstræde 2, 1171 Copenhagen
  
  [www.italiano.dk](http://www.italiano.dk) / [info@italiano.dk](mailto:info@italiano.dk)
Overview program, DTU-COST-RILEM Doctoral Course  
**Service life of Cement-based Materials and Structures**  
Technical University of Denmark, Lyngby, Denmark, 15-19 August 2016  
Organized by: Ole Mejlhede Jensen, Konstantin Kovler, Stéphanie Staquet and Miguel Azenha

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<tr>
<th>Time</th>
<th>Monday 15</th>
<th>Tuesday 16</th>
<th>Wednesday 17</th>
<th>Thursday 18</th>
<th>Friday 19</th>
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<tbody>
<tr>
<td>8:00</td>
<td>1. Introduction to course and presentation of participants (omj)</td>
<td>6. Autogenous deformation Lecture (omj)</td>
<td>10. Restrained deformation Lecture (sst)</td>
<td>14. Thermo-mechanical modelling Lecture (maz)</td>
<td>19. Preparation of participant presentations (omj)</td>
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<td>16:00</td>
<td>5. Barbecue</td>
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<td>18. Course dinner</td>
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Module responsible: Miguel Azenha (maz), Jose Granja (jlg), Ole Mejlhede Jensen (omj), Konstantin Kovler (kko), Dirk Schlikie (dsc), Stéphanie Staquet (sst)

Rev. 15.8.16
Venue: Technical University of Denmark (DTU), Brovej, Building 118, Room 007.

21 participants; 5 groups with 4 students

Instructors:
Kurt Kielsgaard Hansen (KKH)
Carsten Rode (CAR)
Anker Nielsen (AN)
Lars Wadsö (LW)

The program for the doctoral course is tentative:
Monday 15 August at 08:30 hrs.

08:30-10:00 Welcome and introduction to the course
Short presentation of teachers and participants. Participants note on list: Name, affiliation, title on home project
Introduction to laboratory working environment and safety (1 hour) (KKH)
10:00-12:00 Theory lessons, examples, exercises (CAR)
12:00-13:00 Lunch
13:00-17:00 Laboratory work. Each group chooses two porous materials – silicate and wood based, respectively - as their material for all laboratory tests during the course
Materials: Aerated concrete, gypsum board, calcium silicate board, burned brick, unburned brick, wood1 – Laminated Veneer Lumber (axial, tangential), wood2 – spruce (axial, radial, tangential)
Start of laboratory work that takes long time until steady state:
   I) Sorption isotherm measurements
      a) In Dynamic Vapor Sorption (DVS) equipment
      b) In desiccators (without vacuum)
      c) In climate chambers (4 chambers available)
   II) Suction measurements. 5 bar and 15 bar extractors. Porous plates and specimens for capillary saturation
Lesson: Accreditation of measurements (2 times) (AN)
Barbeque reception, 17.30 – 19.30 hrs. in front of Building 118, DTU

Tuesday 16 August at 08:30 hrs.

08:30-12:00 Presentation of all PhD-students’ home project. Each PhD-student: 12 minutes + 3 minutes discussion
12:00-13:00 Lunch
13:00-15:00 Presentation of all PhD-students’ home project (continued)
15:00-17:00 Laboratory work.
   III) Measurements of porosity and densities
   IV) Measurements of water vapor permeability (3 parallel specimens for wet cup and for dry cup)
      a) Specimens fixed in plexiglass (perplex) rings by use of epoxy (no masked edge)
      b) Specimens not inserted in plexiglass rings i.e. specimen perimeter shadowed by cup tightening of specimen (masked edge). Common exercise on aerated concrete
   V) Dry-out experiments start up (aerated concrete, gypsum board, calcium silicate board, burned brick).
     Cases: 1) Without air velocity, with low air velocity, with high air velocity around specimens. Find critical moisture content
Students make continued measurements on setup from Day 1

Wednesday 17 August at 08:30 hrs.

08:30-09:00 Exercise results from Monday
09:00-11:00 Theory lessons, examples, exercises (CAR)
11:00-12:00 Laboratory work. Students make continued measurements on setup from Day 1 and Day 2
12:00-13:00 Lunch
13:00-15:30 Laboratory work. Students make continued measurements on setup from Day 1 and Day 2
15:30-17:00 Senior Research Engineer Carsten Gundlach, DTU Physics: Introduction to 3D X-ray scanning
Thursday 18 August at 08:30 hrs.

08:30-09:00 Exercise results from Wednesday
09:00-10:00 Theory lesson, examples, exercises (CAR)
10:00-12:00 Calculation exercise (AN)
Critical analysis of measurements and results (AN)
Uncertainty in measurements (AN)
Discussion
12:00-13:00 Lunch
13:00-15:30 Students make continued measurements on setup from Day 1, Day 2 and Day 3
15:45-18:00 Study tour. Starts from DTU, building 101
18:00-20:00 PhD course dinner at DTU for all PhD-students

Friday 19 August at 08:30

08:30-09:00 Exercise results from Thursday
09:00-11:00 Theory lessons, examples, exercises (CAR)
11:00-12:00 Students make continued measurements on set-up from Day 1, Day 2, Day 3 and Day 4
12:00-13:00 Lunch
13:00-15:00 Start on reporting of measurements and comparison to theory. Each group is responsible for a specific measuring technique.
15:00-17:00 Presentation of preliminary status for the groups. Each group is responsible for a specific measuring technique. Each group: 20 minutes including discussion

(Conference 21 – 24 August)

Thursday 25 August at 08:30

08:30-10:00 Laboratory work. Students make continued measurements on set-up from first week
10:00-12:00 Professor Lars Wadsö, Lund University: Introduction to laboratory exercises on Lund University
Friday 26 August
12:00-13:00 Lunch
13:00-14:00 Professor Lars Wadsö (continued)
14:00-17:00 Laboratory work. Students make continued measurements on set-up from first week

Friday 26 August at 08:00

08:00 Departure from DTU by bus. Arrival 09:30 at Lund University, Sweden. ALL STUDENTS: Do remember to bring your passport. Everyone is recommended to check what other documents they might need for their entry into Sweden. 10:00 to 12:30 Laboratory exercises, part A (LW)
12:30 to 13:15 Lunch
13:15 to 14:30 Lab tour (LW)
14:30 to 17:00 Laboratory exercises, part B (LW)
17:00 to 18:00 Plenum: Discussion of observations and measurement results
18:15 Departure from Lund University by bus. Arrival 20:00 at DTU

Saturday 27 August

09:00-10:00 Analysis of experiments from first week and from Lund University. Discussion with instructors
10:00-11:00 How to use measurement data as input data for simulation programs as Delphin and WUFI (CAR)
11:00-12:00 Laboratory work. Students make continued measurements on set-up from first week
12:00-13:00 Lunch
13:00-17:00 Laboratory work. Students make continued measurements on set-up from first week
Evening: Barbecue to be arranged
Sunday 28 August

09:00-10:00 Analysis of experiments from first week
10:00-12:00 Laboratory work. Students make continued measurements on set-up from first week
12:00-13:00 Lunch
13:00-17:00 Reporting of measurements and comparison to theory. Each group is responsible for a specific measuring technique: Exchange of results from other groups and short comparison and analysis of results. Start preparing poster and PowerPoint presentation for Monday

Monday 29 August at 08:30 hrs.

08:30-10:30 Poster and PowerPoint presentation finalization
10:30-12:30 Examination: Each group presents their poster and supply with PowerPoint presentation (45 minutes per group). Instructors comment the findings.
The presentation is expected to include:
- All measurements and results made by the group
- As responsible for a specific measuring technique: Exchange of results from this technique and short comparison and analysis of results.
12:30-13:30 Lunch
13:30-16:30 Examination continued
16:30-17:00 Evaluation and closure

Note: Lessons will be based on lecture notes, scientific papers and copy of presentations.
## Overview program, DTU-RILEM Doctoral Course

**Concrete with Supplementary Cementitious Materials**  
Technical University of Denmark, Lyngby, Denmark, 15-19 August 2016  
Organized by: Ole Mejlahe Jensen, Konstantin Kovler and Nele de Belie

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<td>6. Autogenous deformation Lecture (omj)</td>
<td>10. Hydration of cements Lecture (blo)</td>
<td>14. Sustainability Lecture (ndb)</td>
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<td>6. Autogenous deformation Lecture (omj)</td>
<td>10. Hydration of cements Lecture (blo)</td>
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Module responsible: Miguel Azenha (maz), Nele De Belie (ndb), Jose Granja (jlg), Ole Mejlahe Jensen (omj), Konstantin Kovler (kko), Barbara Lothenbach (blo), Didier Snoeck (dsn), Stephanie Staquet (sst)

Rev. 15.8.16
## Overview program, DTU-RILEM Doctoral Course

**Concrete and Radiological Aspects**

Technical University of Denmark, Lyngby, Denmark, 15-19 August 2016
Organized by: Ole Mejlhede Jensen, Zoltán Sas and Wouter Schroeyers

Module responsible: Miguel Azenha (maz), Jose Granja (jlg), Ole Mejlhede Jensen (omj), Konstantin Kovler (kko), Zoltán Sas (zsa), Wouter Schroeyers (wsc), Stéphanie Staquet (sst)

### Monday 15

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### Tuesday 16

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18. Course dinner
# MSSCE 2016 – Doctoral Course Programme

## Monday 15/8 2016

**BIM in Civil Engineering - focusing on open standards**

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td><strong>Module 1</strong></td>
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<tr>
<td>08.30-11.00</td>
<td>Introduction to BuildingSMART principles</td>
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<td>Information Delivery Manuals(IDM), part 1</td>
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<td>Interaction Framework, ISO 29841, part 1 and 2</td>
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<td>Develop an Information Delivery Manual</td>
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Tuesday 16/8 2016

BIM in Civil Engineering - focusing on open standards

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<td><strong>Coffee Break</strong></td>
<td>11.00-11.30</td>
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<tr>
<td><strong>Module 2</strong></td>
<td>Industry Foundation Classes #2</td>
<td>Jan Karlshøj</td>
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<tr>
<td>11.30-12.30</td>
<td>• Spatial Structure</td>
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<tr>
<td><strong>Location:</strong></td>
<td>• Core layer</td>
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<td><strong>Lunch Break</strong></td>
<td>12.30-13.30</td>
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<td><strong>Module 3</strong></td>
<td>Industry Foundation Classes #3</td>
<td>Jan Karlshøj</td>
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<tr>
<td>13.30-15.00</td>
<td>• Interoperability layer</td>
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<td><strong>Location:</strong></td>
<td>• Domain</td>
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<td><strong>Coffee Break</strong></td>
<td>15.00-15.30</td>
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<tr>
<td><strong>Module 4</strong></td>
<td>Identifying IFC entities, properties and relations</td>
<td>Jan Karlshøj</td>
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<tr>
<td>15.30-17.00</td>
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</table>
## Wednesday 17/8 2016

BIM in Civil Engineering - focusing on open standards

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
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</table>
| **Module 1** | **08.30-11.00**  
**Location:**  
Building 101  
Room S16      | Industry Foundation Classes #4  
- Resource layer  
- Geometry  
- Location  
- Cost  
- Classification | Lecture  
Jan Karlshøj |
| **Coffee Break** | **11.00-11.30**                                                                 |                |
| **Module 2** | **11.30-12.30**  
**Location:**  
Building 101  
Room S16      | Industry Foundation Classes #5  
- Infrastructure | Lecture  
Jan Karlshøj |
| **Lunch Break** | **12.30-13.30**                                                              |                |
| **Module 3** | **13.30-15.00**  
**Location:**  
Building 101  
Room S16      | BIM Collaboration Format (BCF)  
- Purpose  
- Structure  
- Experiences  
- Tools | Lecture  
Jan Karlshøj |
| **Coffee Break** | **15.00-15.30**                                                              |                |
| **Module 4** | **15.30-17.00**  
**Location:**  
Building 101  
Room S16      | Identifying IFC entities, properties and relations.  
#2, BCF use cases. | Exercise  
Jan Karlshøj |
**Thursday 18/8 2016**

**BIM in Civil Engineering - focusing on open standards**

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td><strong>Module 1</strong> 08.30-11.00</td>
<td>Model View Definition - Subset of IFC specification, Mandatory or optional content, Software implementation, mvdXML</td>
<td>Lecture, Jan Karlshøj</td>
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<tr>
<td><strong>Location:</strong> Building 101 Room S16</td>
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<tr>
<td><strong>Coffee Break</strong> 11.00-11.30</td>
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<tr>
<td><strong>Module 2</strong> 11.30-12.30</td>
<td>Certification - Software certification, Human certification, Data Validation</td>
<td>Lecture, Jan Karlshøj</td>
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<tr>
<td><strong>Location:</strong> Building 101 Room S16</td>
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<tr>
<td><strong>Lunch Break</strong> 12.30-13.30</td>
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<tr>
<td><strong>Module 3</strong> 13.30-15.00</td>
<td>Tool for generation of documentation, mvdXML - COBie, ifcDOC, Jason, OWL</td>
<td>Lecture, Jan Karlshøj, Tim Chipman</td>
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<tr>
<td><strong>Location:</strong> Building 101 Room S16</td>
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<tr>
<td><strong>Coffee Break</strong> 15.00-15.30</td>
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<tr>
<td><strong>Module 4</strong> 15.30-17.00</td>
<td>Generation of a Model View Definition</td>
<td>Exercise, Jan Karlshøj</td>
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<tr>
<td><strong>Location:</strong> Building 101 Room S16</td>
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</table>
# Friday 19/8 2016

## BIM in Civil Engineering - focusing on open standards

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
</tr>
</thead>
</table>
| Module 1 | BuildingSMART Data Dictionary (bsDD)  
- Structure  
- Contents  
- Software implementation guidance | Lecture | Håvard Bell |
| Location: Building 101 Room S16 |
| Coffee Break | 11.00-11.30 |
| Module 2 | Model Server  
- Principles  
- Commercial servers  
- Open source model server  
- Query languages | Lecture | Väino Tarandi |
| Location: Building 101 Room S16 |
| Lunch Break | 12.30-13.30 |
| Module 3 | Closing  
- Repetition | Lecture | Jan Karlshøj |
| Location: Building 101 Room S16 |
| Coffee Break | 15.00-15.30 |
| Module 4 | Questions and answers regarding reports. | Exercise | Jan Karlshøj |
| Location: Building 101 Room S16 |
MSSCE 2016 – Doctoral Course Programme

Monday 15/8 2016

Clay and shale

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td><strong>Module 1</strong></td>
<td>Crystal structures, chemistry and formation of clay</td>
<td>Emil Makovicky</td>
</tr>
<tr>
<td>08.30-10.15</td>
<td>minerals; Building 101 DTU</td>
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<tr>
<td><strong>Location:</strong></td>
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<tr>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>10.15-10.45</td>
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<tr>
<td><strong>Module 2</strong></td>
<td>Demonstration of clay preparation methods and powder</td>
<td>Louise J. Belmonte</td>
</tr>
<tr>
<td>10.45-12.30</td>
<td>diffraction analysis</td>
<td>Emil Makovicky</td>
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<tr>
<td><strong>Location:</strong></td>
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<tr>
<td><strong>Module 3</strong></td>
<td>Crystal structures, chemistry and formation of clay</td>
<td>Emil Makovicky</td>
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<td><strong>Coffee Break</strong></td>
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<td>15.00-15.30</td>
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<tr>
<td><strong>Module 4</strong></td>
<td>Mineral determination practicals</td>
<td>Emil Makovicky, L.J.</td>
</tr>
<tr>
<td>15.30-17.00</td>
<td>Belmonte</td>
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*Barbecue in Grønnegården, DTU*

17.15-19.15
### Tuesday 16/8 2016

#### Clay and shale

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
<th>Lecturer</th>
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</thead>
<tbody>
<tr>
<td><strong>Module 1</strong> 08.30-10.15</td>
<td><strong>Electrochemistry of the clay surfaces.</strong> Theory of the electrical double layer with speciation. Exercises related to the computation of the mineral surface charge. Connection with the cation exchange capacity. The Donnan model. Influence of the electrical double layer regarding the composition of the pore water.</td>
<td>André Revil</td>
</tr>
<tr>
<td><strong>Location:</strong> DTU Building 101 Room S07</td>
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<tr>
<td><strong>Coffee Break</strong> 10.15-10.45</td>
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<tr>
<td><strong>Module 2</strong> 10.45-12.30</td>
<td><strong>Observations regarding transport properties.</strong> Observations associated with the osmotic pressure. Observations associated with coupling properties. Electrokinetic effects. Reverse osmosis. The diffusion of ions in clay</td>
<td>André Revil</td>
</tr>
<tr>
<td><strong>Location:</strong> DTU Building 101 Room S07</td>
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<tr>
<td><strong>Lunch Break</strong> 12.30-13.30</td>
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<tr>
<td><strong>Module 3</strong> 13.30-15.00</td>
<td><strong>Theory</strong> The constitutive equations with cross-coupling effects. Where they are coming from? How they can be modeled? A fundamental theory in unsaturated conditions.</td>
<td>André Revil</td>
</tr>
<tr>
<td><strong>Location:</strong> DTU Building 101 Room S07</td>
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<tr>
<td><strong>Coffee Break</strong> 15.00-15.30</td>
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<tr>
<td><strong>Module 4</strong> 15.30-17.00</td>
<td><strong>Predictions and comparison with data.</strong> Application to the modelling of electrokinetic properties. Application to the modelling of the reverse osmosis in bentonite. Application to the modelling of the mutual diffusion coefficient of NaCl in bentonite.</td>
<td>André Revil</td>
</tr>
<tr>
<td><strong>Location:</strong> DTU Building 101 Room S07</td>
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<tr>
<td><strong>Poster session, DTU Building 101, Room S07</strong></td>
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### Wednesday 17/8 2016

#### Clay and shale

<table>
<thead>
<tr>
<th>Module</th>
<th>Type of activity</th>
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</table>
| **Module 1**  
08.30-10.15 | Constitutive modelling of clay: An introduction to elastoplasticity               | Lars Vabbersgaard Andersen  
Associate Professor  
Dept. Civil Engineering  
Aalborg University  
Denmark                                                                 |
| **Location:**  
DTU Building 101 Room S07 |                                                                 |                                                                         |
| **Coffee Break**  
10.15-10.45 |                                                                 |                                                                         |
| **Module 2**  
10.45-12.30 | Constitutive modelling of clay: Implementation in finite-element models          | Lars Vabbersgaard Andersen  
Associate Professor  
Dept. Civil Engineering  
Aalborg University  
Denmark                                                                 |
| **Location:**  
DTU Building 101 Room S07 |                                                                 |                                                                         |
| **Lunch Break**  
12.30-13.30 |                                                                 |                                                                         |
| **Module 3**  
13.30-15.00 | Constitutive modelling of clay: Critical-state soil mechanics, consolidation and effective stresses | Lars Vabbersgaard Andersen  
Associate Professor  
Dept. Civil Engineering  
Aalborg University  
Denmark                                                                 |
| **Location:**  
DTU Building 101 Room S07 |                                                                 |                                                                         |
| **Coffee Break**  
15.00-15.30 |                                                                 |                                                                         |
| **Module 4**  
15.30-17.00 | Constitutive modelling of clay: Example models in commercial software            | Lars Vabbersgaard Andersen  
Associate Professor  
Dept. Civil Engineering  
Aalborg University  
Denmark                                                                 |
| **Location:**  
DTU Building 101 Room S07 |                                                                 |                                                                         |
Thursday 18/8 2016

Clay and shale

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<tr>
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<tbody>
<tr>
<td><strong>Module 1</strong>&lt;br&gt;08.30-10.15</td>
<td>Challenges and opportunities of shales in the oil industry: Borehole stability during drilling, Shale barriers around cased wells, Source rocks and oil / gas shales, Fracturing, 4D seismic monitoring of reservoirs through the overburden</td>
<td>Lecture&lt;br&gt;Rune M Holt</td>
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<td><strong>Coffee Break</strong>&lt;br&gt;10.15-10.45</td>
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<tr>
<td><strong>Module 2</strong>&lt;br&gt;10.45-12.30</td>
<td>Shale Rock Physics &amp; Mechanics: Fundamentals of elastic anisotropy.</td>
<td>Lecture + Classroom exercise&lt;br&gt;Rune M Holt</td>
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<tr>
<td><strong>Location</strong>:&lt;br&gt;DTU Building 101 Room S07</td>
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<td><strong>Lunch Break</strong>&lt;br&gt;12.30-13.30</td>
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<tr>
<td><strong>Module 3</strong>&lt;br&gt;13.30-15.00</td>
<td>Shale Rock Physics: Observations of elastic wave velocities in shales, and how they relate to porosity, mineralogy, stress, temperature and frequency.</td>
<td>Lecture + Classroom exercise&lt;br&gt;Rune M Holt</td>
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<tr>
<td><strong>Module 4</strong>&lt;br&gt;15.30-17.00</td>
<td>Shale Rock Mechanics: Laboratory experiments, static moduli and strength, water sensitivity, anisotropic behaviour, creep. Static and dynamic moduli.</td>
<td>Lecture&lt;br&gt;Rune M Holt</td>
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<tr>
<td><strong>Location</strong>:&lt;br&gt;DTU Building 101 Room S07</td>
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<tr>
<td><strong>Dinner at the DTU Canteen</strong>&lt;br&gt;18.30-21.00</td>
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Friday 19/8 2016
Clay and shale

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<tr>
<td>08.30-10.15</td>
<td>Fehmarn Belt Fixed Link</td>
<td>Niels Foged</td>
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<tr>
<td>13.30-15.00</td>
<td>Practical shale petrophysics</td>
<td>Finn Engstrøm</td>
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<tr>
<td>15.30-17.00</td>
<td>Practical shale petrophysics</td>
<td>Finn Engstrøm</td>
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<tr>
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</table>
## Draft time table

### Monday 22/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Tuesday 23/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Wednesday 24/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Thursday 25/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Friday 26/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Saturday 27/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
  - Technical tour to Open Air Museum
  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet

### Sunday 28/08/2016
- **08:00-10:00**
  - R221 RS02
  - MSSCE2016 sessions
- **10:15-10:45**
  - Coffee Break
- **10:45-11:15**
  - MSSCE2016 sessions
  - Workshops
- **11:15-12:00**
  - Technical tour to Open Air Museum
- **12:00-12:30**
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  - Technical tour to Stevns Cliffs and Roskilde Cathedral
- **12:30-13:30**
  - Conference Reception Buffet