

tions to the understanding of the kinematics of viscoelastic flows, making an outstanding contribution to the field internationally. He has also made a demonstrable contribution to rheology in Australia through significant contributions to the understanding of flows occurring in injection molding processes with benefits to Australian industry through his collaboration with Moldflow, and the reduction of grain losses due to pulverisation in silos. Evidence for his outstanding contribution to the field was also demonstrated in letters from 5 world leading rheologists: Ken Walters, Roger Tanner, Nhan Phan-Thien, Ian Frigaard, and Tam Sridhar.

The social programme was designed to include time for re-connecting with old friends and making new ones, with two long lunch breaks, Wednesday evening drinks and networking session and an enjoyable conference dinner at Cyren at Sydney's iconic Darling Harbour. During the dinner, researchers from the two countries were chatting about the differences of food, culture and education system between Australia

and Korea, which enhanced the understanding and friendship among researchers. On the last day of the conference, some participants took an excursion trip to the beautiful Blue Mountains in the outskirts of Sydney. I gather our Korean colleagues especially enjoyed an introduction to beautiful Australian fauna and flora by Peter Daivis (ASR, President), while walking up through almost vertical steps in the mountain near Three Sisters. Overall this was a valuable and enjoyable conference for the Australian and Korean rheology communities. Thanks to the conference sponsors, Anton Paar, T. A. Instruments, A.T.A Scientific and The University of Sydney.

Thanks also to the organising committee Peter Daivis, ASR President, Jason Stokes, ASR Vice-President, Heather Shewan, ASR Council, Ravi Jagadeeshan, ASR Council, and Ahmad Jabbarzadeh, ASR Council.

Heather M. Shewan
h.shewan@uq.edu.au

27th Conference and Workshop on Rheology of Building Materials

OSTBAYERISCHE TECHNISCHE HOCHSCHULE (OTH) REGENSBURG, GERMANY
MARCH 7–8, 2018

On March 7, the 27th conference on Rheology of Building Materials took place at the Ostbayerische Technische Hochschule (OTH) in Regensburg, Germany. For 27 years, this conference has become a firmly established international event. This year again more than 140 participants from 17 countries joined this conference. Fourteen very interesting presentations showed different investigations and applications within the field of rheology. Organic and inorganic rheology modifying agents for concrete and mortar, but also for oil well cement as well as the measurement techniques via different rheometers and alternative methods were in the focus of discussions.

The opening of the lectures was done with welcome address by Markus Greim, CEO of Schleibinger Geräte GmbH, and Wolfgang Kusterle, OTH Regensburg, who informed about the program and the targets of rheological measurements as well as occurring problems. Then, the president of the OTH Regensburg, Wolf-

gang Baier, welcomed all delegates and speaker. The first lecture was held by Ghada Bassioni from the Ain Shams University, Cairo, Egypt. She presented her investigations in the field of oil well cement. Different superplasticizers, classical as well as of the newer generations, were tested for their rheological performance providing a huge data base for the mathematical model. The model based on artificial neural networks can be used to predict the viscosities of mortars using modern polycarboxylate based superplasticizers without having to deal with many different and time-consuming experiments. An overview about the screed compositions and properties was given by Roland Augustin from the IBF Institut für Baustoffprüfung und Fußbodenforschung, Troisdorf, Germany. Modern screeds are multicomponent and highly complex systems. By using different additives and admixtures the properties of such systems can be customized. The characterization of these mixtures can be done using different measure-



Figure 1: Participants during the presentations of the 27th conference.



Figure 2: Breaks between the lectures for exchange of opinions and discussions.

ment techniques. He also showed the legal weaknesses with respect to screed compositions and screed performance, which are still valid.

The next session was on the mineral rheological additives for concrete applications. Dry mix and ready mix mortars need gel-forming sag or slip control agents to avoid potential application problems. The investigations on gel formation capacity of mortar in presence of mineral rheological additives under static and dynamic conditions were presented by Alberto Fernández-Ibarburu from TOLSA SA, Madrid, Spain. The characterization of the mixtures was done by using of flow table and the rheometer Viskomat NT. Flow table test is simple, fast and useful method but shows weaknesses in rheological studies. From the evaluation of the flow curve over time parameters for the gel formation and the net behavior could be derived which describe the power of the mineral based viscosity modifying agents in comparison to the cellulose based additives. Next lecture presented by Paloma Christina Frías de León also from TOLSA SA, Madrid, Spain, gave an overview about a new Advance Rheology Modifying Admixture (ARMA) developed as concrete stabilizer and how it can be used in the most favorable way. The characterizations were done by field validation testing and rheology measurements with a mortar rheometer.

Investigations on repeatability and reproducibility of measurements of rheological parameters of cement mortars using rheometers Viskomat NT and Viskomat XL were presented by Jacek Gołaszewski from the Silesian University of Technology, Gliwice, Poland. It could be shown that the influence of the operator, time period of measurements and procedure on reproducibility is small compared to the influence of the cement and admixture batch. Viktor Mechtcherine introduced the priority pro-

gram “Opus Fluidum Futurum – Rheology of reactive, multiscale, multiphase construction materials” (SPP 2005). The goal of this program is to ascertain and describe the scientific fundamentals for understanding and consecutively designing rheology-based construction processes as well as for developing innovative, sustainable building materials and associated pioneering processing technologies. The entire duration of the program is six years. The total funding volume will be approximately 15 Million Euro. Sara Leinitz from Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin presented first results about the correlations between different testing methods. Two different rheometers were used for the investigations of the rheological parameters of different paste and mortar mixtures as well as the classical measurement of the flow diameter.

The optimization of mixtures regarding their rheological effects due to the adjusting of the different aggregate fractions was presented by Wolfram Schmidt, BAM. The dry aggregates' flow coefficients were determined and compared to yield stress and plastic viscosity values at different aggregate volume fractions. The results indicated that the flow coefficient is not a suitable parameter to predict the performance of the aggregates in the paste. With increased volume fraction of aggregates, both yield stress and plastic viscosity increase. However, each aggregate blend of two different fractions has a unique effect that applies relative to other blends regardless of the aggregate volume fraction, even at very low volume fractions. A clear range of aggregate grading curves can be identified to minimize the yield stress. For the plastic viscosity it could be found that aggregates between 2 mm and 8 mm apparently have limited influence but once these sizes are exceeded an increasing amount of aggregate fraction



Figure 3: Workshop about the thermal conductivity measurement on building materials with Henry Taubmann, CEO of C3 Prozess- und Analysetechnik.

8 mm to 16 mm significantly causes a viscosity increase. The highest viscosities were found regardless of the smaller aggregate fraction at a percentage of 80 % of the coarsest aggregates.

The investigations on the sedimentation stability under vibration were shown by Christoph Begemann from the Leibniz Universität Hannover, Germany. His research is based on variations of the volume of paste and aggregates regarding the rheological as well as the segregation behavior of the mixtures. The stability increases with a smoother grading curve and a smaller maximum size of the coarser aggregates. The rheology and the determination of the rheological parameters such as yield stress play an important role also for Controlled Low Strength Material (CLSM) also known as flowable fill which will be used for backfilling sewer and construction pits. An alternative method for the yield stress determination of CLSM was presented by Jürgen Quarg-Vonscheidt from the Hochschule Koblenz, Germany. For this purpose a so called modified Visko-Waage was developed showing good reproducibility of the results and ability for simply practical application on the construction site. Investigations on pumping behavior of modern concrete were presented by Egor Secrieru from the Technische Universität Dresden, Germany. The main objective of his research is to assess the concrete pumpability applying existing rheological tools and validate the results in full-scale pumping experiments.

The squeeze-flow is a rheological test based on the compression of a cylindrical sample between two parallel plates and has been used as an alternative / complementary method for characterizing fresh mortars. Fábio A. Cardoso from University of São Paulo, Brazil, presented an experimental method that associates the squeeze-flow test and a pressure mapping system to assess the pressure distribution evolution throughout the squeeze-flow of different mortars. The results of the test allowed the identification of pressure fluctuations and flow instabilities. During production fluctuations in the flow properties of SCC are typical even for



Figure 4: Workshop for rheological measurements with Sliper and eBT-V at the concrete laboratory of the OTH Regensburg.

the same SCC formulation. A project funded by the Bavarian Research Foundation deals with the mixer in-line measurement of the workability and the on-line control of the fresh concrete. First results were presented by Ivan Paric from the OTH. The last lecture of this conference was held by Ludwig Hertwig from the HTWK Leipzig, Germany. He presented an application of the self-consolidating, high performance fine-grained concrete for the injection process as a powerful alternative to casting. During injection, the compression and distribution energy of the injected pump pressure can additionally be utilized, which leads to better workability of the concrete matrix and further to an economical advantage.

After the conference in the evening, as every year, the participants were able to discuss and deepen various topics in a typical Bavarian location in the historical city of Regensburg. A very pleasant atmosphere led to the establishment of new contacts and exchange of ideas. On March 8th, next day after conference, three practically oriented workshops were organized by C3 Prozess- und Analysetechnik GmbH and Schleibinger Geräte GmbH together with OTH Regensburg. More than 60 participants followed the interesting demonstrations.

Conference proceedings can be obtained by the publisher Tredition GmbH. The next 28th Regensburg colloquium and workshop will take place in March 2019 as usual at the same location at OTH Regensburg. More information will be available on www.schleibinger.com.

H. Keller, M. Greim
Schleibinger Geräte GmbH
Gewerbestr. 4, 84428 Buchbach, Germany
info@schleibinger.com

W. Kusterle
Ostbayerische Technische Hochschule Regensburg,
Faculty of Civil Engineering
Galgenbergstr. 30, 93053 Regensburg, Germany
wolfgang.kusterle@oth-regensburg.de