WORKSHOP

STRUCTURAL DESIGN OF LAMINATED GLASS INCLUDING THE SHEAR COUPLING EFFECT THROUGH THE POLYMERIC INTERLAYER: A COMPARISON OF DIFFERENT CALCULATION APPROACHES

SUMMARY

Numerous investigations have shown that the maximum glass stresses in laminated glass (LG) can be reduced significantly by respecting the shear bond through the polymeric interlayer during the structural design process. The large variety of interlayer materials and the typical time- and temperature-dependent behaviour of polymers make the consideration of the interlayer in the design of laminated glass complex. Standards and guidelines therefore offer a wide variety of approaches, which will be explained and compared in this workshop.

The workshop will be split into two parts. The first session introduces the mechanical behaviour of different laminated glass interlayers, with a special focus on time and temperature dependency. In addition, it will be shown how this material behaviour can be determined experimentally. The second part deals with current design approaches in national and international standards and guidelines. The different approaches (e.g. ω-method, simplified effective thickness method and different levels of accuracy in FE modelling e.g. linear elastic or viscoelastic) are explained and the results compared.

TIMETABLE 26TH OF JUNE

9:00 Welcome to workshop, introduction of the participants
9:15 Backgrounds on the testing, evaluation and constitutive modelling of the shear transfer in glass laminates
10:45 Coffee break
11:00 Expamples for design and computation considering shear transfer
12:15 Discussion and conclusions
12:30 End of the workshop

Duration: 2,5 hours

ORGANISERS

MIRIAM SCHUSTER, TU DARMSTADT

studied Civil Engineering from 2009 to 2014 at University of Luxembourg and TU Darmstadt where she specialized on structural engineering. After working in the Luxembourgish engineering office Schroeder&Associés she returned to TU Darmstadt in February 2016 as a researcher in the Institute of Structural Mechanics and Design under the supervision of Prof. Dr.-Ing. Jens Schneider. Her field of research concentrates on the mechanical behaviour of intact and fractured laminated glass with a main focus on the thermo-viscoelastic polymeric interlayer modelling.

MICHAEL KRAUS, UNIVERSITY OF GERMAN ARMED FORCES, MUNICH

Michael Anton Kraus studied Civil Engineering from 2008 to 2013 at the Technical University Munich with a specialisation in structural engineering. From 2012 to 2014 he was selected for the Honours program of the Bavarian Graduate School of Computational Engineering (BGCE). Since 2015 Michael Kraus has been working at the Institute and Laboratory for Structural Engineering at the University of German Armed Forces in Munich under the supervision of Univ.-Prof. Dr.-Ing. Geralt Siebert. Special aspects of his research lie in the fields of the application of uncertainty quantification and sensitivity analysis, material modelling and system identification to practical engineering problems in the field of structural glass engineering. Michael Kraus defended his PhD thesis on 'Machine Learning Techniques for the Material Parameter Identification of Laminated Glass in the Intact and Post-Fracture State' in February 2019.

MARTIN BOTZ, UNIVERSITY OF GERMAN ARMED FORCES, MUNICH

Martin Botz is a research assistant at the Institute and Laboratory for sructural engineering at the University of German Armed Forces in Munich under the supervision of Univ.-Prof. Dr.-Ing. Geralt Siebert. He graduated with a Master of Science degree in civil engineering at the University of German Armed Forces in Munich in 2013. Before joining the research team of Prof. Siebert in 2016, he worked as EOD (explosive ordnance disposal) – officer in the German army.
His research area is the field of structural glass engineering, especially the investigation of polymer interlayers used in laminated glass.
The focus is on the material behavior of the interlayers in the post-fractured state of laminated glass.