

 CMSCCOMPOSITES
MANUFACTURING &
SIMULATION CENTERcdmHUB
Composites Design
& Manufacturing HUB

GLOBAL COMPOSITES EXPERTS

WEBINAR SERIES 2022-23



REMKO AKKERMAN-UNIVERSITY OF TWENTE

COMPOSITES FORMING SIMULATIONS

ON PHYSICS & DATA, ACCURACY & APPLICABILITY

May 18, 2023 at 11:00 AM US Eastern Daylight Time

ABSTRACT

Composites Forming processes, in particular stamp forming, offer the potential of high volume manufacturing of light weight structural parts. Such parts need to be designed with the process and its requirements in mind, in order to prevent process induced defects such as wrinkling or poor consolidation. Process simulations can help to avoid such defects. This lecture will address the background of such “design for composite manufacturing” methods.

Describing the deformations of composite laminates requires a dedicated approach. This holds for the relevant particular deformation mechanisms, related specific aspects of continuum mechanics, their implementation in simulation software, the constitutive models and characterization experiments to obtain the required material property data. An overview on these matters will be presented, addressing the current state-of-the-art and potential improvements, bearing in mind that predictive methods of this kind can only be truly successful if they are useable for a wide(r) community.



REMKO AKKERMAN, PHD

University of Twente and Scientific Director, Thermoplastic Composite Research Centre

B I O

After receiving his engineer's degree in Mechanical Engineering in 1988 (on turbomachinery), Remko Akkerman received his PhD on viscoelastic flow simulations in the group of prof. Huétink in 1993 at the University of Twente. He started working as an assistant professor in the chair of Engineering Design in Plastics with prof. Powell and got involved in fibre reinforced polymers. In 2003 he was appointed as full professor in Production Technology, keeping a focus on lightweight materials for structural applications, with a clear emphasis on composite materials. The group's research is characterized by an integral approach on design, materials and processing, combining experimental and analytical / simulation work.

He has been the secretary of the Esaform association (European Scientific Association of Material Forming) from 2007 to 2013, and since June 2009 he is the scientific director of the ThermoPlastic Composite Research Centre, founded by Ten Cate, Fokker, Boeing and the University of Twente. In 10 years' time, the centre has grown to more than 20 members, covering the whole thermoplastic composites value chain, and to a globally respected institute on TPCs. He is a member of the Scientific Committees of FPCM, Flow Processes in Composite Materials, and of Texcomp, Textile Composites. As such, he chaired the FPCM-12 conference at the University of Twente in 2014. He is a member of the KHMW and of the management team of 4tu.htm, the Dutch research centre for high-tech materials of the 4tu Federation. He further participates in the international advisory boards of large research programmes such as Cimcomp in the UK and SM4I in Japan.