

PIZZA SEMINAR

DESIGN OF HIGH-STRENGTH AND ULTRA-HIGH-STRENGTH STEELS IN THE FRAME OF EUROCODE 3

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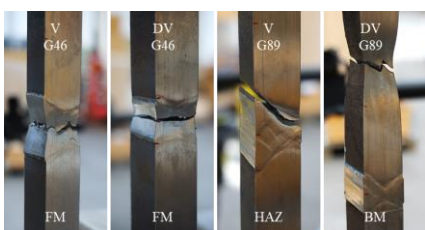
Ulrike Kuhlmann is a Professor of steel, timber and composite structures and was head of the Institute of Structural Design at the Universität Stuttgart since 1995 until her retirement in 2024. She had 7 years of industrial experience before coming back to university and is a partner in the consulting office 'Kuhlmann-Gerold-Zipperlen' since 1998. From April 2013 to March 2017, she was dean of the Faculty of Civil and Environmental Engineering at Stuttgart University. As a member of numerous expert committees, she is actively involved in European Standardisation work. From 2009 to 2023, she chaired CEN/TC250/SC3 "Structural Eurocodes: Eurocode 3: Design of Steel Structures". For her contributions, Ulrike Kuhlmann received the "Charles Massonnet Award" of ECCS in 2024. Since 2021, she has been vice-president of Berlin-Brandenburg Academy of Sciences and Humanities, and since 2022 Member of acatech, National Academy of Science and Engineering.



In terms of sustainability, the use of ultra-high-strength steel up to S960 can save resources, improve connections efficiently, and extend the service life of bridges. These benefits can be realised through the use of high-strength steel (HSS) and ultra-high-strength steel (UHSS) in structural design. The extension of Eurocode 3 from S700 to S960 is currently being addressed in the forthcoming standard prEN 1993-1-12. At the same time, further investigations are required to better understand the structural behaviour of HSS and UHSS and adapt existing provisions of Eurocode 3.



Extensive experimental investigations on butt and fillet welds in S960 have been conducted, to extend the current design concepts to cover the application of UHSS. Although high-strength steels typically offer limited benefits for fatigue-critical structures, the use of high-frequency mechanical impact (HFMI) treatment has demonstrated significant improvements in fatigue strength with increasing material yield strength. The use of hollow section joints fabricated from HSS and UHSS has been the subject of focused research to address the relevant failure modes, including considerations related to connection ductility, within a joint research cluster in Germany.



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