Prospect for European Guidance for the Structural Design of Tensile Membrane Structures

Support to the implementation, harmonization and further development of the Eurocodes

Within CEN/TC 250/WG 5, CEN/TC 248/WG 4, the TensiNet Association and COST Action TU1303, an international team of researchers, engineers, architects, material producers and manufacturers has been working on this report, which provides background information in support of the implementation and development of a future Eurocode for the Structural Design of Tensile Membrane Structures. Tensioned Membrane Structures have unique properties compared to the more conventional built environment. Besides their low self-weight and high flexibility these structures are known to be 'optimally' constructed, as they are only loaded in tension. It results in shapes adapted to the flow of forces and a minimum of material needed to realise the span. Despite a considerable amount of scientific knowledge exists, only few design codes are available. A common standardised approach as well as a comprehensive European design
standard is needed in order to provide verification techniques, a common pool of design approaches and to achieve a harmonized safety level. This background document consists of three major parts: (a) general explanations giving scientific and technical background for the design of membrane structures, (b) state-of-the-art overview on existing national and European rules and recommendations on the design of membrane structures, and (c) proposals for European harmonized design rules, which could be part of the future Eurocode for Tensile Membrane Structures. The final aim is to develop a Eurocode for the Structural Design of Tensile Membrane Structures which will help to design and implement these lightweight structures. The Eurocode will not only assist and support the industry and engineering offices but will also encourage potential clients to choose these sustainable applications.