

European ETFE-Design – New Findings and Concepts

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ABSTRACT

The plenary lecture on European ETFE-design aims to give an insight into the ongoing development of standardization and research activities for foil structures. With the publication of the Technical Specification prCEN/TS 19102, the European Committee for Standardization (CEN) will provide for the first time a European standard for the design, analysis and execution of buildings and structural works made from structural membrane material. This includes many kinds of tensioned membrane structures. The term “membranes” includes fabrics as well as foils in general and ETFE-foils in particular. In this standard, a new design concept for foil structures is established, harmonized among experts across Europe which will be presented including background information regarding the design of foil structures in the Ultimate and Serviceability Limit State. The safe and economic design of foil structures presupposes a comprehensive understanding of the material and seam behaviour. For this purpose, an overview will be given on different research projects which examine the short- and long-term behaviour of ETFE-foils and their weldments. Subject of these projects are for example the tensile, creep and relaxation behaviour of the base material under uniaxial and biaxial stress ratios as well as the tensile behaviour of the weld seams. Another main emphasis of the research of ETFE weld seams is the optimization of the welding and testing procedure. The achieved knowledge will strengthen and enrich the achieved state of the Technical Specification prCEN/TS 19102 in the domain of ETFE-foil structures design.

REFERENCES

[1] prCEN/TS 19102:2020-10, Design of tensioned membrane structures (Final Draft).