7th ECCOMAS Thematic Conference on the Mechanical Response of Composites: COMPOSITES 2019
A. Turon, P. Maimí & M. Fagerström (Editors)

# EXPERIMENTAL INVESTIGATION OF THE QUASI-STATIC AND DYNAMIC CRUSHING OF 2D WOVEN CFRP FORMULA 1 CRASH STRUCTURES

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Recent developments in high-fidelity and robust composite damage modelling facilitate a better understanding of the crushing behavior of carbon fibre crash structures. In-turn, the final designs of such structures can be further optimized within shorter timeframes, by significantly reducing the extent of experimental crash testing and replacing with simulation. This reduction in testing is especially useful in Formula 1 (F1), where the design cycles are very short.

One of the currently debated issues in the field of composite damage modelling is the effects of strain-rate on the crush response of such composite components. In particular, limited literature is available on the variation in crush behavior of woven CFRP structures subjected to different crush velocities [1].

This work presents an experimental comparison between the quasi-static and dynamic crushing behavior of a standard F1 Side-Impact-Structure (SIS). The quasi-static experiments were carried out using a tensile testing machine, while the dynamic crush tests were performed following the standard F1 crash test setup.

## References

[1] McGregor C, Vaziri R, Poursartip A, Xiao X. Axial crushing of triaxially braided composite tubes at quasi-static and dynamic rates. Compos Struct 2016;157:197–206. doi:10.1016/j.compstruct.2016.08.035.

H2020-MSCA-ITN-ETN No 721256

# An experimental and numerical investigation of the crushing behaviour of 2D woven CFRP Formula 1 crash structures

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ECCOMAS 2019, Girona

18th September 2019

*ICONIC has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 721256. The content reflects only the author's view and the Agency is not responsible for any use that may be made of the information it contains.*