Editorial

Structural applications of aluminium have grown considerably in the last decades. In transportation, the low mass weight, resulting in a high strength to weight ratio, makes aluminium a favourable material for aircrafts, high speed trains, ferries, and last but not least cars. In building engineering and other civil engineering applications, sometimes the low weight property determines the choice of aluminium, for example for movable bridges or helicopter decks. However, more often favourable properties such as corrosion resistance, easy shaping of profiles by extrusion, and aesthetics are of importance.

A condition for successful structural application of aluminium is the availability of design rules. Several national standards do exist, some of them even for decades, but with the release of "Eurocode 9: Design of Aluminium Structures" a new challenge for structural aluminium applications exists. Eurocode 9 is by far the most extensive and up-to-date standard compared to national standards of various European countries.

Aluminium and steel are different materials but design problems are similar. Aluminium differs from steel in its physical properties (low mass weight, stiffness and linear expansion) and in its mechanical properties (strength and elongation), the latter as a result of alloy hardening. A designer should make use of the advantages of aluminium- in particular its light weight, extrudability and corrosion resistance- and find adequate solutions for the disadvantages such as its low stiffness, resulting in stability being a more predominant design aspect, and its lesser fatigue and fire resistance, when compared to steel.

This special edition of Heron deals with a number of topics, illustrating the above mentioned challenges for structural aluminium applications. The authors of the articles are acknowledged for their contributions to this issue, which may further enhance the application of aluminium in building engineering and other civil engineering applications.

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