



Prof. Dr. Kypros Pilakoutas

Prof. Kypros Pilakoutas is the Professor of Construction Innovation and Director of the Centre for Cement and Concrete at the University of Sheffield. He obtained his degrees at Imperial College, London, and he was awarded the title of Doctor Honoris Causa by the Technical University of Iasi, where he is also a Visiting Professor. He is also a visiting professor at the Cyprus University of Technology and University of Science and Culture, Tehran. His research is in the fields of structural concrete, FRP, FRC, repair, construction innovation and earthquake engineering. He has over 500 papers and reports; mostly in refereed journals and conferences.

He led research contracts in excess of €20M including >20 EU projects. These include major multi-partner projects such as “Eurocrete”, “ConFibreCrete”, “Encore”, “Ecolanes” “Bandit”, “Endure and Anagennisi, with more than 40 international partners. He sits or leads many International Committees, edits/reviews papers for top International journals, participates in scientific committees, chairs sessions in the main conferences in his field and is invited to present keynote papers. He advises internationally (+20 countries) on promotions, research exercises, national standards and major grant reviews. He is a Director of two technologies spin-out companies. He has over 30 patents awarded. Three of his patents are commercially exploited worldwide.

TOTAL RECYCLING OF TYRE COMPONENTS IN CONCRETE

Abstract: All end-of-life tyre constituents (rubber, steel wire and textile reinforcement) are high quality materials and the work presented aimed to recycle and use them as reinforcement in structural concrete applications. Rubber particles were used to substitute mineral aggregates in concrete and develop Rubberised Concrete (RuC), which when confined with Aramid/Carbon FRP (CRuC), it led to compressive strengths of up to 90 MPa and, more significantly, axial deformations of up to 6%. The seismic performance of RC medium/large scale piers improved the energy dissipation up to 50% and increased ductility up to 25% - (compared to unconfined RuC). Recycled Tyre Steel Fibres (RTSF) were found to be able to partially replace manufactured steel fibres and to increase the flexural strength of concrete. The best flexural performance was found from hybrid mixes, indicating that mixes containing both RTSF and manufactured fibres (MSF) can show better flexural performance than MSF-only mixes at the same fibre dosage. Steel Fibre Reinforced Rubberised Concrete (SFRRuC) can offer a concrete pavement system that has similar flexibility to flexible pavements, flexural strength similar to rigid concrete pavements and good durability properties and freeze & amp; thaw resistance. When subjected to elevated temperatures, Recycled Tyre Polymer Fibre (RTPF) reinforced concrete showed remarkable resistance to spalling, confirming the potential of these fibres for fire-induced concrete spalling mitigation.