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Advancement in materials engineering at Swansea University: A journey into the future

Materials engineering is considered one of the largest areas that is significantly expanding around the globe. This discipline has seen an extensive development at Swansea University over the past years investigating materials for various engineering applications. Titanium, titanium aluminides, nickel super-alloys alongside steel alloys for aeroengine applications are amongst those which have extensively been investigated. These high temperature materials which have typically been developed for the Rolls-Royce gas turbine aeroengines proved to be strong enough to withstand the severe environments in the gas turbine. The work is still ongoing at Swansea University to take these alloys into a higher level and promote their success. The various works that has been carried out over the years in bringing that into reality as well as the potential future projects that will take place at the materials research center at Swansea. Moreover, the current work on developing the Rolls-Royce most efficient aeroengine, i.e. the Ultrafan[®]. The newly developed UltraFan[®] changes the whole engine architecture to allow the fan and the turbine to be independently optimized by the introduction of a power gearbox capable of operating at anything up to 100,000 HP.

Biography

Zakaria Abdallah is the Principal and Lead Research Officer of Fatigue and Fracture in the Steel and Metals Institute at Swansea University, UK. He has worked at the Rolls-Royce University Technology Centre at Swansea University and as Consultant for many industries, e.g. Airbus, TIMET, ETD, Rolls-Royce, in UK within Swansea Materials Research and Testing (SMaRT) Ltd. His research interests are in steel and metals, composite materials, materials characterization, creep and fatigue, life predictions of materials, thermo-mechanical testing and heat treatment optimization.

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