



SEMINAR III

Thursday, 18.1.2024, 13:00, Kolar's Lecture Hall

Effect of Al-Cu-Fe quasicrystal particles on the reinforcement of a polymer-matrix composite: from surface to mechanical properties

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This study is about the basic underlying optimisation of composites made from a technical polymer polyphthalamide (PPA) and quasicrystal Al-Cu-Fe-B (QC) powder. The fabricated composites exhibit potential in automotive and whiteware appliances, where mechanical integrity needs to be intersected with high mechanical strength, low wear and low adhesion, for example, in bearings and cogs.

The presence of the QC powder in the polymer matrix causes a low abrasion of the steel counterpart material and, consequently, a high wear resistance. A combination of the desired QC and polymer properties indicates the investigated materials as technologically promising where it is essential to minimise the wear-induced mechanical debris and simultaneously preserve excellent mechanical properties such as strength, hardness and toughness of the PPA/QC composite. The most valuable additional contribution is a demonstration of the link between the surfenergy, friction and a percolation threshold of the dual powder filling, resulting in the achievement of the optimum mechanical properties.

Kindly invited.