CRACK BRIDING MODELING IN BIOGLASS®-BASED SCAFFOLDS REINFORCED BY POLYVINYL ALCOHOL/MICROFIBRILLATED CELLULOSE COMPOSITE COATING

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This work deals with crack bridging modelling in Bioglass® based scaffolds due the presence of a special polymer coating. This includes a careful modelling of the scaffold which is based on x-ray computed micro-tomography (micro-CT) scans and identification of bridging mechanism with the aid of extensive fractographic observations of coated, broken struts. A replacement of the real structure of scaffold by a periodic model utilizing Kelvin cell whose size corresponds to the mean cell size of the real foam is discussed. The struts of the idealized foam are modelled using the beam elements. A detailed computational analysis of crack bridging due to coating film fibrils under plane strain conditions is presented and an improvement of fracture resistance of coated scaffolds is explained.