

Voxel Models as Input for Heat Transfer Simulations with Siemens NX Based on X-Ray Microtomography Images of Random Fibre Reinforced Composites

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Abstract : A method is proposed in order to create a three-dimensional finite element model representing fibre reinforced insulation materials for the simulation software Siemens NX. VoxTex software, a tool for quantification of μ CT images of fibrous materials, is used for the transformation of microtomography images of random fibre reinforced composites into finite element models. An automatic tool was developed to execute the import of the models to the thermal solver module of Siemens NX. The paper describes the numerical tools used for the image quantification and the transformation and illustrates them on several thermal simulations of fibre reinforced insulation blankets filled with low thermal conductive fillers. The calculation of thermal conductivity is validated by comparison with the experimental data.

Keywords : analysis, modelling, thermal, voxel

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