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A Numerical Model of Interpenetrated Composite Including Interface Properties

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Abstract

Advanced multiphase ceramic composites (MCCs) are employed in several modern industrial sectors, for example, aerospace, automotive or energy. The composites are used when extreme conditions like variable loads, impact loads or thermal shocks are expected.

The presentation deals with examples of interpenetrated composites (IPCs). The previous analyses of the composite materials showed the significance of the interface between the phases for the loading resistance of the material [1,2]. The interface forming is affected by the diffusion of the materials. The effect of diffusion of the phases is presented in [3]. An attempt to include the mechanical properties of the interface based on atomistic simulations is given in the presentation.

An analysis of samples of IPC based on SiC ceramic skeleton and an aluminium alloy under impact is performed. The structure of the material is obtained with CT scans. The numerical model considers the properties of the interfaces between the phases. It has been noted that the interface properties are a significant feature of the materials.

Acknowledgement: Grant from National Scientific Committee (PL) UMO-2019/33/B/ST8; Polish National Agency for Academic Exchange (NAWA) [BPN/ULM/2021/1/00115/U/DRAFT/00001].

Calculations: PL-GRID National Facilities: CYFRONET, Krakow, Poland. ICM at the University of Warsaw, Poland and TASK, Gdansk, Poland.

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