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BASED ON THE MINIMUM ENERGY PRINCIPLE PREDICTION OF CRACK SPACING AND DEPTH OF CERAMICS UNDER THERMAL SHOCK

Abstract

based on experimental results and failure mechanism of ceramics under thermal shock, the transient temperature field and stress field were calculated by combining heat transfer and mechanical theory. A simplified shear lag analysis using a progressive scheme is proposed for ceramics, a theory method for predicting thermal shock crack spacing was developed by using the minimum energy principle with the crack spacing and depth as variables, in according to experimental result. The present research provides help for deeply understanding the failure mechanism of ceramics under thermal shock, improving the performance and designing new ceramics.