

## Accepted Manuscript

Title: A novel theoretical model to predict the temperature-dependent fracture strength of ceramic materials

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PII: S0955-2219(17)30467-3  
DOI: <http://dx.doi.org/doi:10.1016/j.jeurceramsoc.2017.06.044>  
Reference: JECS 11348

To appear in: *Journal of the European Ceramic Society*

Received date: 28-4-2017  
Revised date: 19-6-2017  
Accepted date: 24-6-2017

Please cite this article as: Deng Yong, Li Weiguo, Shao Jiaying, Zhang Xianhe, Kou Haibo, Geng Peiji, Zhang Xuyao, Li Ying, Ma Jianzuo. A novel theoretical model to predict the temperature-dependent fracture strength of ceramic materials. *Journal of The European Ceramic Society* <http://dx.doi.org/10.1016/j.jeurceramsoc.2017.06.044>

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**A novel theoretical model to predict the temperature-dependent fracture strength  
of ceramic materials**

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**Abstract**

A novel temperature-dependent fracture strength model for ceramic materials is developed, based on a critical fracture energy density associated with material fracture comprising strain energy, the corresponding equivalent potential energy, and kinetic energy of atoms per unit volume. It relates the fracture strength at high temperatures to that at the reference temperature, the temperature-dependent Young's modulus, the temperature, and the melting point. The model is verified by comparison with experimental data of ceramic materials. The model predictions and the experimental data are in excellent agreement with each other. As the Young's modulus can easily be obtained by experiments and the melting point can easily be obtained by materials

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