

## Limiting Fracture Stress of Composite Ceramics with Symmetric Triangle Eutectic

**Authors :** Jian Zheng, Jinfeng Yu, Xinhua Ni

**Abstract :** The limiting fracture stress predicting model of composite ceramics with symmetric triangle eutectic was established based on its special microscopic structure. The symmetric triangle eutectic is consisted of matrix, the strong constraint inter-phase and reinforced fiber inclusions which are 120 degrees uniform symmetrical distribution. Considering the conditions of the rupture of the cohesive bond between matrix and fibers in eutectic and the stress concentration effect at the fiber end, the intrinsic fracture stress of eutectic was obtained. Based on the biggest micro-damage strain in eutectic, defining the load function, the macro-damage fracture stress of symmetric triangle eutectic was determined by boundary conditions. Introducing the conception of critical zone, the theoretical limiting fracture stress forecasting model of composite ceramics was got, and the stress was related to the fiber size and fiber volume fraction in eutectic. The calculated results agreed with the experimental results in the literature.

**Keywords :** symmetric triangle eutectic, composite ceramics, limiting stress, intrinsic fracture stress

**Conference Title :** ICMNM 2017 : International Conference on Micro and Nano Materials

**Conference Location :** Copenhagen, Denmark

**Conference Dates :** October 02-03, 2017