

Accepted Manuscript

Finite element implementation of the tension-shear coupled fracture criterion for numerical simulations of brittle-ductile transition in silicon carbide ceramic grinding

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PII: S0020-7403(18)30228-5
DOI: <https://doi.org/10.1016/j.ijmecsci.2018.07.043>
Reference: MS 4455

To appear in: *International Journal of Mechanical Sciences*

Received date: 22 January 2018
Revised date: 12 June 2018
Accepted date: 28 July 2018

Please cite this article as: Jianbo Dai , Honghua Su , Wenbo Zhou , Tengfei Yu , Wenfeng Ding , Quanli Zhang , Yihao Zheng , Finite element implementation of the tension-shear coupled fracture criterion for numerical simulations of brittle-ductile transition in silicon carbide ceramic grinding, *International Journal of Mechanical Sciences* (2018), doi: <https://doi.org/10.1016/j.ijmecsci.2018.07.043>

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Highlights

- The tension-shear coupled fracture criterion was proposed to simulate the brittle-ductile transition phenomenon in the brittle materials machining process.
- Tension-shear coupled fracture criterion is more suitable than the equivalent plastic strain fracture criterion for the simulation of brittle materials precision machining.
- The equivalent plastic strain parameter could be used to distinguish the materials removed in ductile mode or brittle mode.
- Even though the materials removed in brittle mode, the plastic deformation may happen and residual stress may be left on the machined surface or subsurface.

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