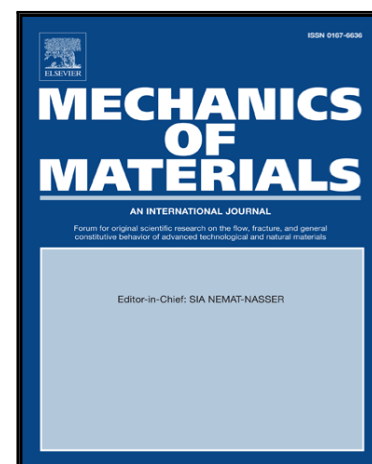


Accepted Manuscript

A macroscopic criterion of shakedown limit for ductile porous materials subjected to general cyclic loadings

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PII: S0167-6636(17)30553-7
DOI: [10.1016/j.mechmat.2017.09.007](https://doi.org/10.1016/j.mechmat.2017.09.007)
Reference: MECMAT 2800



To appear in: *Mechanics of Materials*

Received date: 10 August 2017
Revised date: 14 September 2017
Accepted date: 18 September 2017

Please cite this article as: J. Zhang, W.Q. Shen, A. Oueslati, G. De Saxcé, A macroscopic criterion of shakedown limit for ductile porous materials subjected to general cyclic loadings, *Mechanics of Materials* (2017), doi: [10.1016/j.mechmat.2017.09.007](https://doi.org/10.1016/j.mechmat.2017.09.007)

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Highlights

- A macroscopic criterion is analytically derived to determine the shakedown domain for ductile porous media with von Mises matrix under repeated loads by the use of Melan's theorem;
- This approach is generalized for all possible intermediate cyclic loading cases ranging between the extreme cases with the choice of a more appropriate trial residual stress field;
- The new analytical criterion, depends on the first and second macroscopic stresses invariants and the sign of the third one;
- The established criterion is accessed by both shakedown direct method and incremental elastic plastic simulations;
- The relationship between the elastic limit and the amplitude of cyclic shakedown limit load is derived.

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