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Architected Squirt-flow Materials for Energy Dissipation TAL COHEN, MIT, PATRICK KURZEJA, University of Duisburg-Essen Lotharstr, KATIA BERTOLDI, Harvard — Hetrogenieties at the pore level of fluid saturated materials have been shown to generate a dominant mode of dissipation by a local flow mechanism known as squirt-flow. In the present study we investigate the internal void architectures that lead to squirt-flow, in an attempt to maximally enhance the material dissipation. We consider materials that can elastically undergo large deformations and thus we account for both material and geometrical nonlinearities. We show, by combination of analytical and numerical investigation, that an intelligent design of the internal structure can dramatically increase the dissipation levels in comparison with equivalent homogeneous internal designs. Therefore we suggest squirt-flow as a promising mechanism to be incorporated in future architected materials that can effectively and reversibly dissipate energy.

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