Foamed polyurethane elastomers:
Interplay between chemical formulation and cell morphology

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Foamed polyurethane (PU) elastomers show a broad variety of properties which result both from the chemical formulation and the cell morphology. For example, the dynamic behavior ranges from very elastic to pronounced viscoelastic. Accordingly, PU elastomers cover numerous applications as diverse as elements in building foundations (elastic) and shock absorber in electronic devices (viscoelastic).

Here we show for rather elastic PU specimen how the chemical formulation and the cell morphology, respectively, influence both the maximum static load at which creeping is insignificant and the corresponding elastic modulus. Furthermore, for the case of additional dynamic loads we study how the fraction of open cells affects mechanical damping and, therefore, dynamic stiffening. This leads us to the application of foamed PU elastomers as constructive parts to isolate vibrations. There little dynamic stiffening is crucial for effective noise prevention.