Supplementary Information (SI) for RSC Applied Polymers.

Supplementary Information

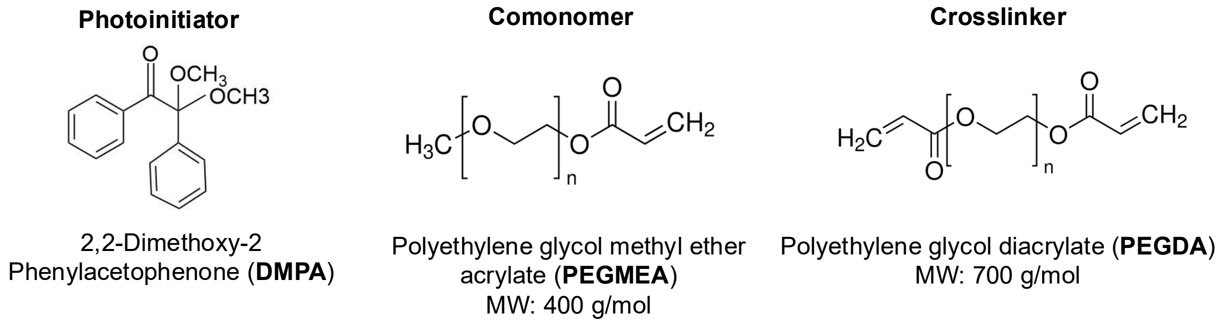

Figure S1: Chemical species employed in resin formulations. All samples were comprised of a comonomer (PEGMEA) and cross-linker (PEGDA); the ratio of these two species was varied to manipulate material stiffness. A conventional photoinitiator, 2,2-dimethoxy-2-phenylacetophenone was used in all formulations to initiate free-radical photopolymerization.

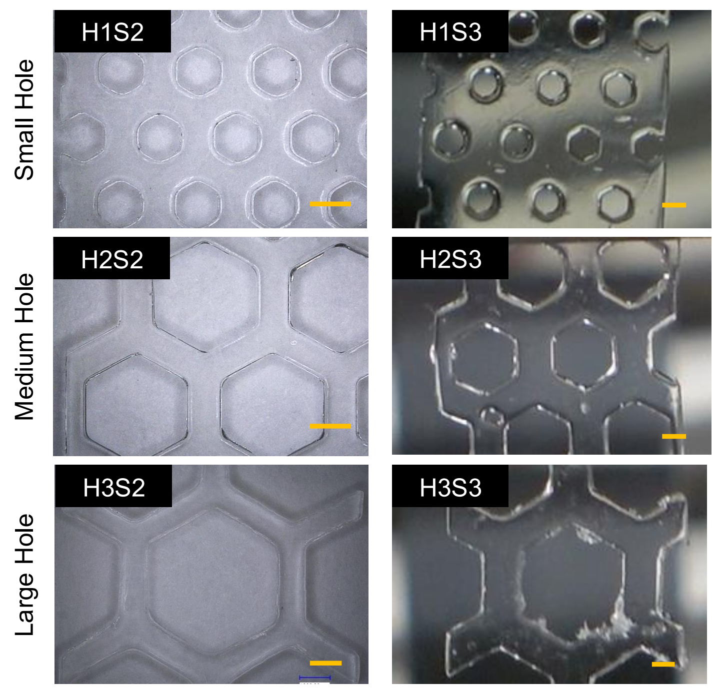

Figure S2: Visual observation highlights differences in lattice samples as a function of photomask patterning. In this image, the differences are highlighted for H_xS2 and H_xS3 samples. In all images, the scale bar corresponds to 1mm.

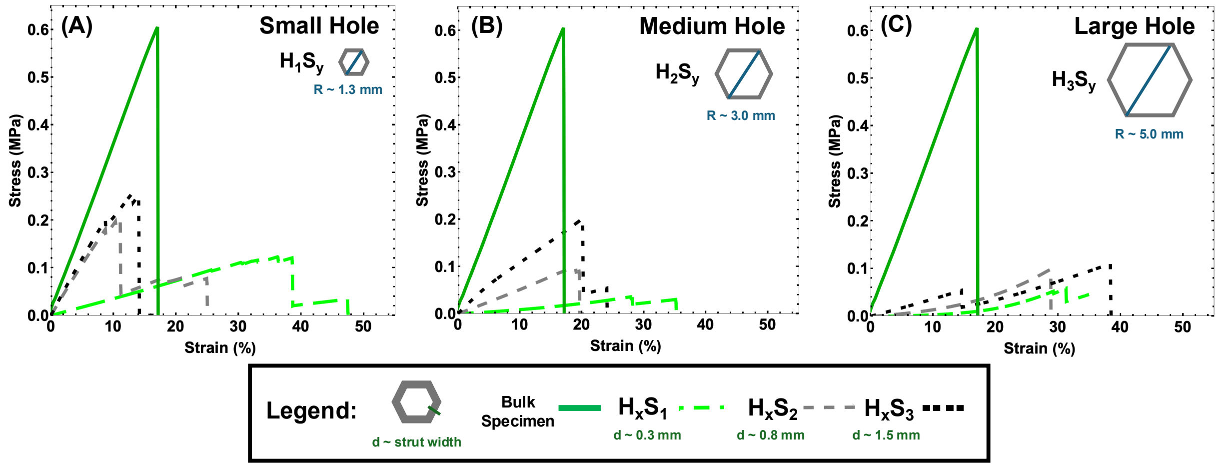

Figure S3: Stress-strain analysis of patterned specimens based in the 20:80 resin formulation. As the general dimension of the pores increases (i.e. hole size), the stress-strain behavior evolves from classic brittle behavior to more diffuse types of failure.

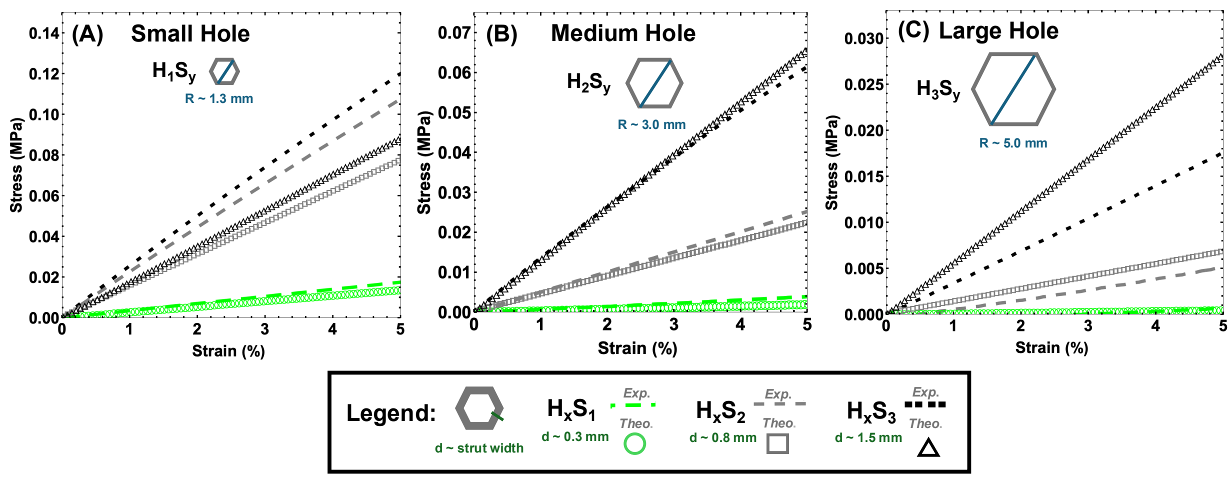

Figure S4: Stress-strain analysis of patterned specimens based in the 20:80 resin formulation at low strains, compared with the theoretical prediction. At low pore sizes (i.e. small holes - (A)), the theoretical prediction underestimates mechanical performance. As porosity increases - this shifts. In all figures open series (○,□,△) correspond to theoretically predicted stress-strain behavior, while dashed series represent experimentally obtained data.

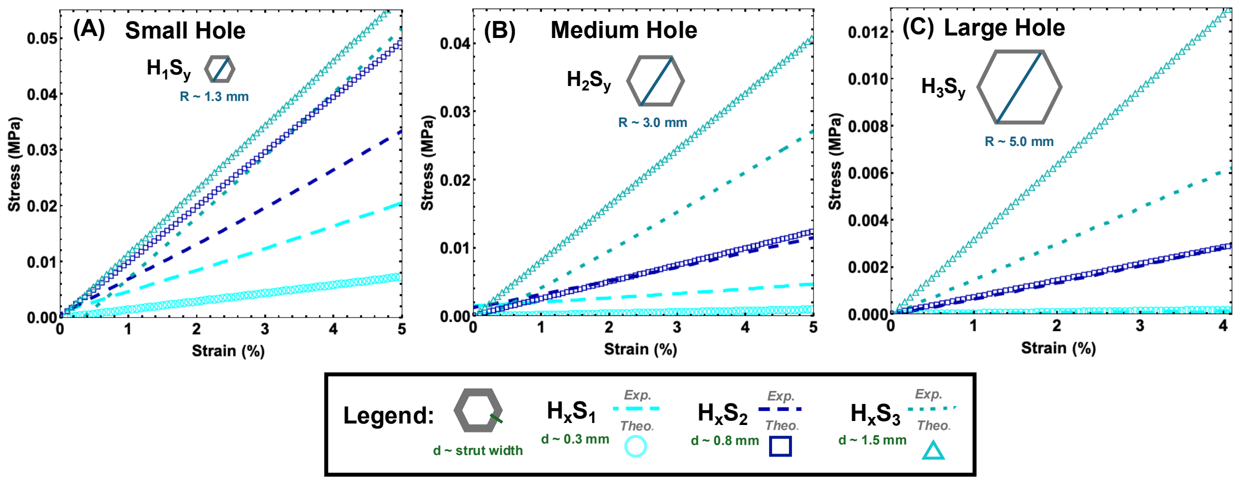

Figure S5: Stress-strain analysis of patterned specimens based in the 10:90 resin formulation at low strains, compared with the theoretical prediction. At low pore sizes (i.e. small holes - (A)), the theoretical prediction underestimates mechanical performance. As porosity increases - this shifts. In all figures open series (○,□,△) correspond to theoretically predicted stress-strain behavior, while dashed series represent experimentally obtained data.

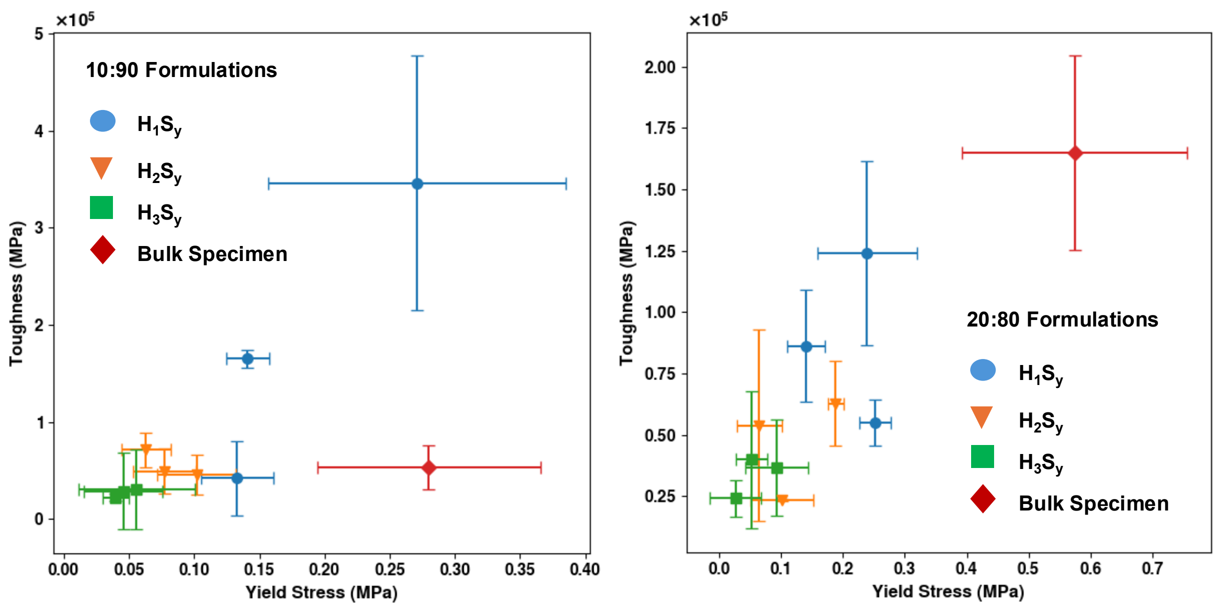

Figure S6: Hexagonal lattice patterning addresses trade-offs in soft polymer networks. By plotting average yield stress (i.e., strength) vs. toughness (i.e., area underneath the stress-strain curves) the influence of patterning, and more specifically pore size is revealed. As pore size decreases (i.e., green to orange to blue series) the trade-off between strength and toughness is significantly reduced. Here this behavior is highlighted for 10:90 (left) and 20:80 (right) networks, with the non-patterned, bulk specimen behavior indicated by the red series.