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**Large Amplitude Oscillatory Shear (LAOS) of Acrylic Emulsion-Based Pressure Sensitive Adhesives (PSAs)** SIPEI ZHANG, ALAN NAKATANI, WILLIAM GRIFFITH, Dow Chemical Co. — Large Amplitude Oscillatory Shear (LAOS) testing has recently taken on renewed interest in the rheological community. It is a very useful tool to probe the viscoelastic response of materials in the non-linear regime. Much of the discussion on polymers in the LAOS field has focused on melts in or near the terminal flow regime. Here we present a LAOS study conducted on a commercial rheometer for acrylic emulsion-based pressure sensitive adhesive (PSA) films in the plateau regime. The films behaved qualitatively similar over an oscillation frequency range of 0.5-5 rad/s. From Fourier transform analysis, the fifth or even the seventh order harmonic could be observed at large applied strains. From stress decomposition analysis or Lissajous curves, inter-cycle elastic softening, or type I behavior, was observed for all films as the strain increases, while intra-cycle strain hardening occurred at strains in the LAOS regime. Overall, as acid content increases, it was found that the trend in elasticity under large applied strains agreed very well with the trend in cohesive strength of the films.

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