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Particle Size Effects in Flow-Stabilized Colloidal Solids SCOTT LINDAUER, ROBERT RIEHN, KAREN DANIELS, North Carolina State University — Flow-stabilized solids (FSS) are a class of fragile matter that forms when a dense suspension of colloids accumulates as it flows against a semi-permeable barrier in a micron-sized Hele-Shaw cell. It has previously been observed that FSS form above a critical flow rate. In order to probe the effect of particle size on the formation of FSS, we perform experiments with monodisperse spherical particles of five distinct sizes. When appropriately scaled by the height of the channel, we observe the expected power law relationship between Pclet number and pile area for all particle sizes. However, the critical Pclet number does not control the onset of pile formation; an additional particle size effect is present. Finally, we characterize the thermal fluctuations of the FSS with respect to the Pclet number.

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