

Abstract Submitted
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The effect of particle shape on granular flow ELI OWENS, SALEM WRIGHT, Presbyterian College — It has long been observed that the pressure at the bottom of a granular container, for instance a grain silo, saturates as the height of the container increases relative to its width. However, the precise effect grain shape has on the buildup of sidewall pressure is not well understood. Using a model silo, we investigated the influence of grain shape on sidewall pressure during the filling process. Our silo is 125 cm tall and 16 cm in diameter, and it is filled with either corn, peas, or rice via a cone shaped hopper. As the silo fills, we monitor the pressure the grains exert on four sections of the wall. We see that the corn and peas behave very differently from the rice. When using the rice, the pressure frequently reaches a peak value and then decays with time. We attribute this decay to rice's large aspect ratio which causes grains higher in the silo to jam and shield the lower grains from the weight above. However, this decay is not as pronounced when using the peas or corn. Since the peas and corn are more round, they can more easily rearrange than the irregular rice particles. As a result, they are not as effective at screening the pressure.

Eli Owens
Presbyterian College

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