

Abstract Submitted
for the SHOCK17 Meeting of
The American Physical Society

Dynamic Tensile Strength of Silicone Oils JUSTIN HUNEULT, JIHANE KAMIL, ANDREW HIGGINS, McGill University, DAVID PLANT, General Fusion — The spall strength of various liquids has been studied using the planar impact of thin flyers to generate large transient negative pressures near the free surface of target samples. The liquids were contained within sealed capsules in which a 4 μm thick aluminized Mylar diaphragm formed a free surface at the back of the sample. The liquid targets were impacted by aluminum and PMMA flyers at velocities ranging from 100 to 700 m/s using a 25-mm-bore gas-gun, thus allowing for large variations in the strain rate and incident shock pressure. The peak tension in the liquid was determined by monitoring the free surface velocity using a photonic Doppler velocimetry (PDV) system. The experimental technique was validated against previously published results for water samples. The paper focuses on the study of a system of silicone oils having vastly different viscosities (5 cP to 30 000 cP), but otherwise similar liquid properties. The results are compared to existing data and models for the dynamic cavitation of liquids.

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Date submitted: 24 Feb 2017

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