

Abstract Submitted
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Impact of Cryogenic Temperatures on the Mechanical Properties of *Steatoda Triangulosa* Spider Silk¹ EDWARD POGOZELSKI, BRENDAN SEE, CHRISTINA KIEFFER, WILLIAM BECKER, STEPHEN PADALINO, Physics and Astronomy, State University of New York at Geneseo, CRAIG SANGER, University of Rochester, Laboratory for Laser Energetics — The mechanical properties of dragline spider silk from the species *Steatoda Triangulosa* are examined at 77K. Dragline silk is used as a structural material to support deuterium - tritium laser fusion targets at the Laboratory for Laser Energetics (LLE) in Rochester, NY. As the targets are filled, the dragline is exposed to cryogenic temperatures. To simulate this environment, silk is dipped into liquid nitrogen. The strength, toughness, and modulus of elasticity of silk in liquid nitrogen are compared to these properties in air. Cryogenic dragline is 200% as strong, 125% as tough, and has an elastic modulus of 300% compared to silk in air at room temperature.

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