

Abstract Submitted
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Monolayer Degradation and Sidewall Tribometer Studies of Vapor Phase Lubricants for MEMS¹ D. ADAM HOOK, BRENDAN MILLER, North Carolina State University, SHANNON J. TIMPE, University of California at Berkeley, MICHAEL T. DUGGER, Sandia National Laboratories, JACQUELINE KRIM, North Carolina State University — Monolayers have been widely used for MEMS to prevent release related stiction as well as adhesion as the devices are stored for long periods of time. Degradation of these monolayers in mechanical contact and at elevated temperatures however render the devices useless after a short period of time. While vapor-phase lubricants have primarily been studied within the context of macroscopic system performance, they may ultimately prove to be the most effective, if not the only, means to deliver and/or replenish a lubricant that can withstand a variety of extreme environmental conditions that a MEMS device is likely to encounter. We have made direct measurements of the change in the coefficient of friction of a MEMS sidewall tribometer as the lubricant is added to a vacuum chamber. Monolayer degradation under normal contact, requirements to prevent device failure, and friction measurements of vapor phase lubricants will be presented.

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