

INM-KOLLOQUIUM

“FAILURE OF PRESSURE SENSITIVE ADHESIVES (PSAS) UNDER SHEAR LOADING”

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INM, Leibniz-Saal, Campus D2 5

Gastgeber: Prof. Eduard Arzt / Dr. René Hensel

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Pressure sensitive adhesives (PSAs) are a common consumer product designed to stick to many surfaces without a chemical reaction during the bonding process. They are commonly studied through peel, shear and probe tack tests. Due to their soft nature and the dissipation of energy during failure each of these tests will yield different fracture energies. Peel and probe tack experiments have been thoroughly explored resulting in a comprehensive understanding of these failure mechanisms. Shear testing, however, is frequently ignored or merely quantified through “time until failure” measurements. This is partially since shear tests take significantly longer for failure to initiate and once it does occur the time scale is quite short. Nonetheless, understanding shear failure, as well as its relation to peeling and probe tack, is critical when designing and selecting PSAs. Tracking the local strain on the backing layer of the PSA shows that in the linear regime prior to fracture a Kaelble model predicts the strain behavior. Failure is initiated through either sliding or cavitation, which depends on the average stress on the PSA. In the final phase of failure (final 30 msec as the sample detaches), it is clear that the average shear stress is not enough to predict the mechanism, and that local stresses play a critical, yet predictable, role. This work uses digital image correlation, a triggered fast camera and tracking of gray levels in images, to understand how PSAs fail when loaded in shear.

Wir laden 15 Minuten vor Beginn zu einem Get-together mit der Referentin ein.

KONTAKT

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