

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Measuring static and dynamic contact angles using a liquid needle. RAYMOND SANEDRIN, KRUSS USA, MING JIN, DANIEL FRESE, CARSTEN SCHEITHAUER, THOMAS WILLERS, KRUSS GmbH — The optical determination of static and advancing contact angle is made on drops applied or extended, respectively, onto a substrate through the use of thin solid needles. Although this method has been used extensively, this method of dosing can be time consuming, cumbersome and if not meticulously performed can lead to erroneous contact angle results. Herein, we present an alternative way of applying drops onto substrates using a small liquid jet, which is produced by a liquid pressure dosing system acting as a “liquid needle.” A comparative static contact angle study on 14 different surfaces with two different liquids were performed utilizing two different ways of dosing: the conventional solid and a novel liquid needle based technique. We found, for all but one sample, that the obtained results were highly comparable. Observed differences can be explained by the characteristics of either way of dosing. In addition, we used the liquid pressure based dosing system for optical advancing contact angle measurement on two different samples. The liquid needle based method facilitates the expansion of a drop from 0.1 to 22 μL within less than 1.2 seconds, which provided constant contact angle versus drop base diameter curves. The obtained results were highly comparable with dynamic Wilhelmy contact angle measurements.

Raymond Sanedrin
KRUSS USA

Date submitted: 29 Jul 2016

Electronic form version 1.4