



C36 Variability in the Measurements of the Slip Resistance of a Wetted Surface When Using a Single Variable Incidence Tribometer and Eight Different Neolite® Test Feet

James E. Flynn, BS, PE, J2 Engineering, Inc., 7636 North Ingram Avenue, Suite 108, Fresno, CA 93711*

After attending this presentation, attendees will learn the values obtained when using a Variable Incidence Tribometer to measure the slip resistance of a wetted surface can be influenced by the specific Neolite® test foot used with the tribometer.

This presentation will impact the forensic community and/or humanity by demonstrating the results of this study which contradict those of other investigators who have indicated that the use of different Neolite test feet will not have an effect on measurements of slip resistance. That contradictions are apparent should alert the forensic community to the necessity of monitoring the test performance of individual Neolite test feet.

The Variable Incidence Tribometer is one of two tribometers which are currently approved by ASTM International for the measurement of the slip resistance of both wet and dry walking surfaces. Although protocols for the use of the Variable Incidence Tribometer are set forth in ASTM International Standard F 1679-00, a precision statement has yet to be included in the Standard. A precision study for the Variable Incidence Tribometer was completed in 1998; however, each of the six independent participants of the study completed testing while using the same Neolite® test foot. This study was conducted to determine whether or not the use of several different Neolite® test feet and a single Variable Incidence Tribometer would result in variability in the measurements of the slip resistance of the metered test surface.

Three glazed ceramic tiles were selected as the test surfaces. Upon receipt, the tiles were first cleaned with acetone and paper towels. After drying, the tiles were again cleaned, this time with a mixture of one liter of distilled water and 5 ml. of Ivory® dish soap. The tiles were subsequently rinsed with distilled water and allowed to air dry. Prior to testing, the Variable Incidence Tribometer was placed on the cleaned tiles and its position on the tile was marked with a Sharpie® pen.

Eight different Neolite test feet were selected and were prepared by sanding with 180 grit 3M wetordry sandpaper. The test feet were attached to the Variable Incidence Tribometer per the instructions set forth in the F 1679 Standard and the operator's manual. Prior to the initiation of testing the tested surface was wetted with a continuous film of distilled water. The test foot was also sprayed with distilled water prior to each test run.

The slip resistance of each of the three test surfaces was measured with each of the eight Neolite® test feet. Four tests of each tile were taken using each of the eight test feet for a total of 32 tests per tile. In an effort to eliminate the effects of potentially non homogeneous tile surfaces, all tests were conducted on the same spot on each of the tiles and the tests were all taken in the same direction.

An analysis of the test results revealed that significant differences in the measurements of slip resistance were obtained through the use of the eight different test feet. Testing of a single wetted tile produced slip resistance readings ranging between 0.18 and 0.42. A reading of 0.18 indicates a very slippery condition while 0.42 can be considered slip resistant.

The observed variations in the measurement of the slip resistance of wetted surfaces indicates the need to monitor the test performance of individual Neolite® test feet.

Variable Incidence Tribometer, Neolite®, Slip Resistance