

**INDISPENSIBLE  
GADGETS IN  
OPHTHALMOLOGY**

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**Cohesion/dispersion assessment of ophthalmic viscosurgical devices (OVD) in relation to the angle of the phacoemulsification insertion tip**

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**Abstract:**

**Purpose:** To determine the effect of the angle of phacoemulsification insertion tip on the cohesion/dispersion properties of Ophthalmic Viscosurgical Devices (OVDs) and to determine the relationship between the CDI (cohesion-dispersion index) and zero-shear (resting) viscosity of an OVD in order to predict its performance during surgery.

**Methods:** Cohesion (CDI) testing was performed on selected OVDs using the automated model developed by Poyer et al. (1998). The phaco tip insertion angle (PTIA) was varied at 90°, 80° or 75° to the OVD surface. Preset fixed vacuum was applied at 125, 250, 375, 500, 600 and 700 mm.Hg. The percentage amount of the OVD aspirated in 2 seconds was plotted against the applied vacuum. The CDI was calculated from the slope of the plot at the break point of the cohesion profile. Standard CDI (at 80°) results were plotted against the zero shear viscosities of the OVDs.

**Results:** The CDI values for PROVISC® (55 at 90°, 44 at 80°, 52 at 75°), VISCOAT® (3.5 at 90°, 3.4 at 80°, 4 at 75°), DisCoVisc® (17 at 90°, 13 at 80°, 12 at 75°), iVisc-Phaco® (4 at 90°, 9 at 80°, 8 at 75°) were not significantly ( $p < 0.05$ ) affected by changing PTIA while HEALON-5® (72 at 90°, 22 at 80°, 59 at 75°) showed CDI results that varied with PTIA.

**Conclusion:** Cohesion/dispersion properties of HEALON-5® vary with PTIA, which is not seen with the other tested OVDs. CDI values were shown to correlate with the zero-shear viscosities in a fashion that predicts the performance of an OVD during cataract surgery.