

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Refractive index matching using a diethyl phthalate/ ethanol solution PAUL MILLER, KURT DANIELSON, JEAN HERTZBERG, University of Colorado, Boulder, ANDY SLIFKA, ELIZABETH DREXLER, NIST, Boulder, GALAN MOODY, University of Colorado, Boulder — When studying internal fluid velocity fields of complex geometries such as *in vitro* cardiovascular models, refractive index matching is critical for undistorted images. A diethyl phthalate (DEP) / ethanol mixture is a good choice of working fluid due to the high index of refraction, low viscosity, safety and low cost. The mixture can be tuned to the refractive index of borosilicate glasses, fused quartz and silicone elastomers. Silicone elastomers do not cloud in DEP/ethanol solutions and also tested negative for change in compliance after DEP exposure. Material compatibility tests showed that only specific formulations of ABS, acrylic, vinyl and PVC plastics are compatible. Measurements were made of index of refraction and viscosity of varied DEP/ ethanol solutions at a range of temperatures, and empirical models for viscosity and refractive index will be presented.

Jean Hertzberg
University of Colorado, Boulder

Date submitted: 11 Aug 2005

Electronic form version 1.4