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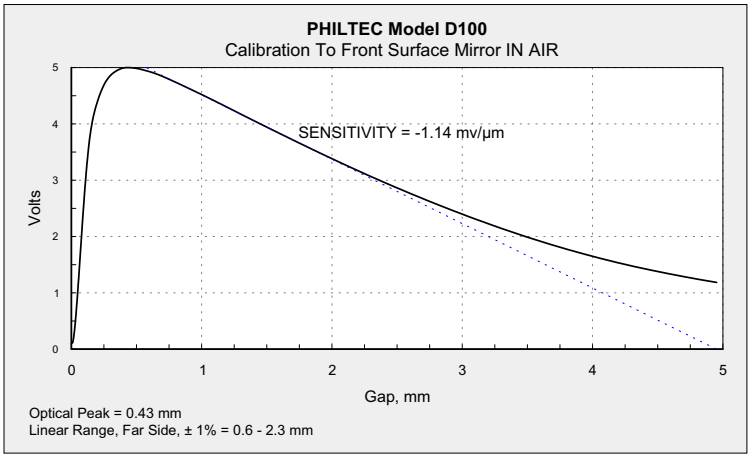
Measurements In Fluids - D Models

Problem

The target to be measured is submerged in a fluid. How can accurate displacement measurements be made using Philtec's fiberoptic sensors?

Solution

The response of the sensor in a fluid is different than the sensor's response in air. Therefore, the sensor must be calibrated in the same medium in which the target resides.



Examples

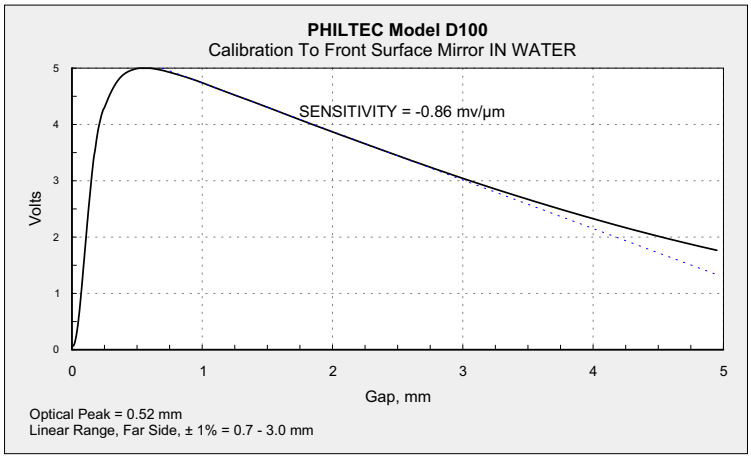
The charts here show our model D100 sensor calibrated in 3 different media: air, water and DOT 5 Silicone Brake Fluid.

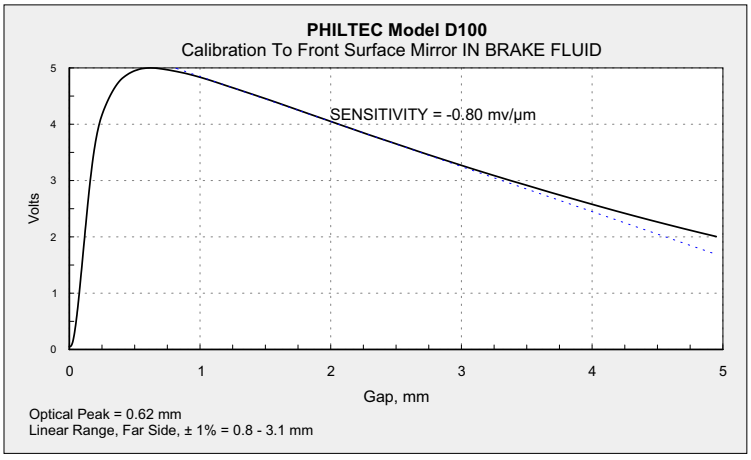
In air, the sensor's Optical Peak occurs at the smallest gap: 0.43 mm

In water the Optical Peak shifts to 0.52 mm

In brake fluid, the Peak shifts to 0.62 mm.

In addition to the shifts in the Optical Peak, the slopes and linear ranges on both the near and far sides are changed proportionately.





Guidelines

a. calibrate in the operational media
b. the air or fluid should be clean; air bubbles and dirt particles should be avoided
c. the sensor tip must be submerged completely