

## **Tapered multimode fiber sensor for ethanol sensing application**

### **ABSTRACT**

Ethanol is a widely used chemical in the industry which can be volatile and flammable. However, the availability of optical sensors for ethanol is still in its maturing stage. In this project, a tapered multimode fiber optic sensor for detection of ethanol with different concentrations in water was developed. The working principle of the sensor is based on absorption spectroscopy in the visible wavelength ranges. The tapered multimode fiber was fabricated using Vytran glass processing workstation to achieve waist diameter and length of 40  $\mu$ m and 20 mm, respectively. Upon exposure to ethanol concentrations of ranges 5% to 40%, the developed fiber sensor absorbance increases linearly. The sensor shows fast response and recovery as low as 14 s and 27 s, respectively.

**Keyword:** Fiber optic sensor; Tapered fiber; Absorbance; Ethanol concentration