Fiber-Optic Sensor for Web Velocity Measurement

Article

Authors

Aravind Seshadri, Pranav-Kumar Peddi-Ravi, Prabhakar R Pagilla

Publication Information

Sensors Journal, IEEE
Volume: 8 , Issue: 7, July 2008, Pages 1099-1104

Abstract

The design and development of a new fiber-optic sensor for measuring the velocity of a continuous material (also called a web) in material processing systems is described. The development of the proposed sensor is based on the dual beam laser Doppler velocimetry technique and the unique properties of different types of optical fibers. The developed sensor is capable of measuring the true web transport velocity as opposed to the existing methods which infer web transport velocity based on the roller angular speed. Since the sensor design utilizes fibers, signal processing can be performed away from the measurement area, and as a result the sensor can be used in harsh environments within the web processing line. The proposed sensor has been constructed and experiments have been conducted on an experimental web platform. The performance of the sensor is evaluated for a range of web velocities and different web materials. Sensor design, its construction, and a representative sample of the results are presented and discussed.

Link to the Article