

Quantitative Measurement Using Fiber Optic Corrosion Sensors



Overview

Structural integrity can be compromised by the simultaneous presence of mechanical loads and corrosive agents. This study investigates the complex interplay between corrosion and impact loads in.



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Abstract: Corrosion-induced optical fiber microbending is demonstrated within this article as an efficient method for the design of sensors for the detection and localization of corrosion events on monitored ...



A quantitative theoretical model linking fiber strain response to corrosion degree was established, incorporating a correction factor K to reduce maximum average relative error to $<3\%$



This paper developed the generalized fiber optic-based sensing models for precise quantification of corrosion severity and its growth rate under impact loads.



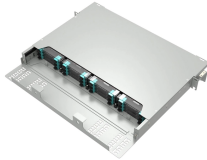
Consequently, a series of fundamental experiments were conducted to capture the corrosion process on a steel plate using a new type of plastic optical fiber (POF) sensor.



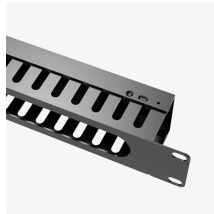
In this study, a fiber optic sensing system based on long period fiber gratings (LPFG) in LP06 and LP07 modes is designed, fabricated and tested for simultaneous measurements of strain, temperature and ...



Corrosion Detection Using Metal Coatings On Fiber Optic Sensors by Paul M. Schindler Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University



To meet these challenges, a novel approach utilizing a plastic optical fiber (POF) sensor is proposed, aimed at enabling the creation of a cost-effective sensor package and an efficient data logging ...



Abstract This paper presents a distributed monitoring approach for detection, visualization, quantification, and warning for pipe corrosion using a single-mode telecommunication-grade fiber ...



In this experiment, a quantitative analysis of the corrosion process was achieved by monitoring strain variations on the steel pipe surface using distributed optical fiber sensors in ...

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