

Fiber optic sensors can measure the depth of small blind holes



Overview

A fiber optic sensor combines the advantages of optical non-contact method and mechanical contact one is developed, which can be used for measuring the diameter and form errors of very small hole or blind hole with diameter down to 0.2 mm and depth to diameter ratio up to 20 was developed. 6 mm) that cannot be accessed using conventional measuring devices due to their size and thus cannot be inspected; Goal: non-destructive. For precise surface mounting (surface mounted technology, SMT) and through plating, in multi-layer boards it is essential to know the exact depth position of the individual copper layers. Particularly for applications in the high-frequency range, even minimal errors in contact position cause. Fiber-optic sensors enable reliable and fast identification, ensuring quality for further processing. In cooperation with our spin-off company Fionec GmbH.



Article Content

Non-contact measurement in micro-drill holes

Using fibre-optic sensors and miniature measuring probes, the layer position, drill hole depth and surface quality in MICROVIAS on multi-layer boards can be detected with high precision.

Measuring Blind Holes And Counterbores

Examine the part print to find the critical depth of the hole diameter, and choose the type of blind hole gage accordingly. Check especially if a precision mating part has to bottom out in the

Development of fiber optic sensor technology

Fraunhofer IPT develops fiber-optic sensors for challenging measurement tasks such as measuring the smallest of boreholes. Using fiber-integrated beam steering and

Hole Detection | wenglor

This requires sensors that can measure the fill level contactlessly and precisely through the narrow bottle opening, regardless of color,

Inspection of micro-drilled holes (>0.1 mm) | fionec fiber optics

In order to perform a non-destructive, production line 100% inspection of the micro-drilled holes, fionec further developed its FDM-2 fiber-optic distance measuring system to accept miniaturized probes.

Fiber optic sensor for measuring very small holes

A fiber optic sensor for measuring the diameter and from errors of very small hole or blind hoe. with diameter down to 0.2 mm and depth to diameter ratio up to 20 was developed. Since

Development of fiber optic sensor technology

Development of fiber optic sensor technology In industrial manufacturing, especially in automotive, microsystems and medical technology, there is an increasing trend

Optical Fiber Sensors: Working Principle, Applications,

This work reviews the fiber-optic sensors based on Bragg gratings, long period gratings, interferometers, surface plasmon resonance, fluorescence,

Small diameter hole profile measuring system and ...

We developed a system to measure the internal profile of small diameter hole. The minimum measurable diameter is 0.14 mm and the maximum measureable depth is 2 mm. The

Laser Sensor for Depth Measurement of a Hole

Dimetix laser distance sensors offer a non-contact, laser-based solution to accurately measure the depth of a hole. Great for measuring deep bores.

Blind Hole

Blind holes for sensor diaphragms can be efficiently processed by laser layer-by-layer ablation. During the processing of large blind holes, the scanning method, scanning parameters, and laser irradiation

(PDF) Optical Fiber Sensors: Working Principle,

Brief theory of sensing principle, fabrication method, applications, advantages and disadvantages of the different fiber-optic sensors, are addressed.

Small diameter hole profile measuring system and ...

The system can measure the roundness, straightness, cylindricity, and roughness. The main difficulty to measure the small diameter hole is in the relative positioning and aligning between

Review of fiber optic sensors in geotechnical health monitoring

Based on the measured strains, three algorithms for transforming monitored data to required displacement were investigated. Comparison analysis regarding typical advantages and

Micron-Precision Tiny Hole Depth Measurement with Confocal

Learn how confocal displacement sensors enable accurate, non-contact tiny hole depth measurement for high-yield manufacturing.

Fiber optic sensor for measuring very small holes

Since optical non-contact methods are difficult to use for measuring the diameter and from errors of small hole at any cross section, a fiber optic sensor, which combines the advantages of optical non

Fiber deflection probe for small hole metrology

Measurement of diameter and form of small holes is of great importance in applications, such as fuel injector nozzles, fiber optic ferrules, wire drawing dies, holes in printed circuit boards

The Basics of Optical Sensors and Common Types

Optical sensors are one of the most popular sensor types in industrial automation. This article covers optical sensor basics and commonly used types,

How to Detect Blind Holes

1□In terms of dimensional measurement, it can accurately measure the diameter, depth, aperture change and other parameters of blind holes through high-precision sensors and optical

Measuring micro-structures and distances | fionec fiber optics

Examples include the inner surfaces of micro-drilled holes, narrow gaps or complex free-form surfaces. The optical inspection technique offers a fast, contactless and wear-free way of measuring micro

Fiber Optic Sensors: Short Review and Applications

An extensive review of optical fiber sensors and the most beneficial applications is presented in this chapter. Although electrical sensing technologies have been successfully deployed

Microsoft Word

Abstract This paper presents the development of a new probing method for Coordinate Measuring Machines (CMM) to inspect the diameter and form of small holes. The technique, referred to as Fiber

Fiber Optic Sensors | Precision, Speed & Versatility in

Explore the advantages of fiber optic sensors, showcasing their precision, speed, and versatility in various applications, from medical to

A 3D Probe for Measuring Small Blind Holes

A 3—D probe for measuring the diameter and form errors at any particular section for small blind holes or slots with diameter or width down to 0.2 mm and depth to diameter ratio up to 20 was

Microhole fiber-optic sensors for nanoliter liquid measurement

Microhole optical fiber sensors have the characteristics of simple structure, enclosed environment, strong light and liquid interaction, which can meet the requirements of multi-parameter,

Fiber Optic Sensors: Types, Working Principle

Explore fiber optic sensors: their working principles, types (intrinsic, extrinsic, hybrid), and diverse applications in mechanical, chemical, and structural health monitoring.

Fiber-Optic Sensors: Detection and Applications

Within the last decade, optical-fiber-based sensors and their detection applications have attracted tremendous attention in the development of sensing

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://invest-bud.com.pl>

Email: sales@ibud-photonics.com

Phone: +33 1 45 62 89 07

Address: 10 Avenue des Champs-Élysées, 75008 Paris, France

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