



# Special Feature: Nondestructive Testing and Evaluation Technology

## Overview

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The area of technology that is concerned with evaluating the reliability and safety of industrial products is becoming increasingly important. Techniques for evaluating the visual appearance of products are also required. In many cases, such evaluation must be carried out in production sites without causing any damage to products. To detect relatively large defects, the use of X-rays can be an effective approach. Unfortunately, practical use of X-rays is difficult in a production site due to the fact that they are blocked by metal components, in addition to the necessity for complex safety precautions. For this reason, on-site testing is normally carried out using nondestructive optical, ultrasonic and electromagnetic techniques.

This special issue focuses on our recent research on nondestructive visualization of defects such as cracks, which are difficult to detect by visual inspection, and on optical techniques for evaluating visual appearance. The first article reports a novel laser ultrasonic inspection method that was shown to be capable of imaging defects such as notches on the back surface of the inspected material. The second article describes the applicability of potential drop techniques to visualize surface crack morphology and to monitor back-wall crack growth. Though this technique is simple, it can be used to develop a structural integrity monitoring system. The third article proposes a new shape measurement method for products such as automobile panels and many types of plated parts with specular surfaces. The final article introduces a newly developed three-dimensional position measuring sensor system based on the light-section method. This system is useful during automobile assembly for ensuring precision fitting of bodies and parts.