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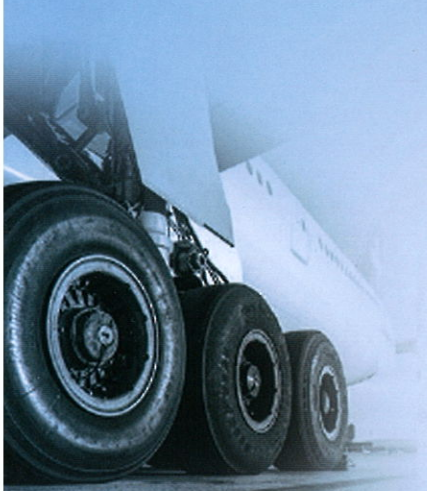
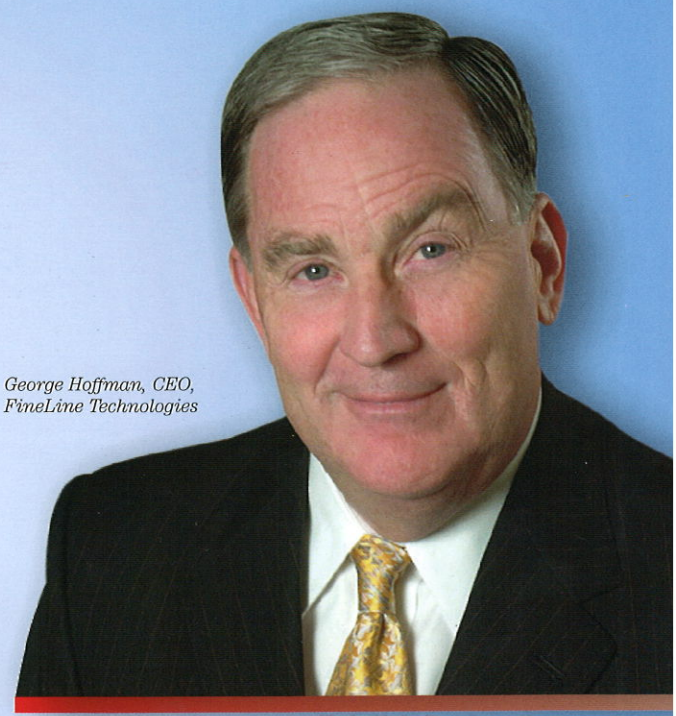
TyreAsia

TRACKING THE TYRE WORLD





George Hoffman, CEO, FineLine Technologies

RFID: THE GAME CHANGER

Anant Goenka

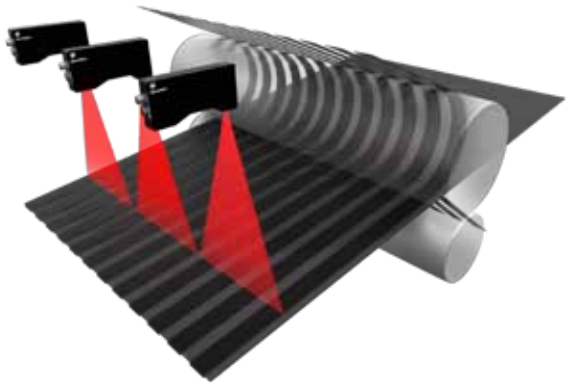
CEAT ON A SURGE

Tony Robinson

TIRE TECHNOLOGY EXPO 2019

3D SMART SENSORS AND THE ADVANTAGES OF HIGH-SPEED, HIGH-SENSITIVITY RUBBER & TYRE INSPECTION

Automated quality control in the rubber and tyre (R&T) industry requires a 3D machine vision solution with specialized features and capabilities. This is because R&T applications involve scanning low-contrast, dark materials with complex geometry at very high speed—something that can only be achieved using robust 3D sensor technology.



Limitations of 2D

System engineers often turn to 2D machine vision sensors to solve their scanning challenges. Unfortunately, 2D on its own cannot provide an adequate solution.

For one, 2D sensors require complex lighting to see the black on black contrast. In some applications the lighting is placed underneath the material (e.g., when measuring the width of a strip), and hot sticking rubber contaminates the lights.

Another disadvantage of 2D sensors is that they can't produce measurements related to object geometry (i.e., 3D shape). As a result they are unable to measure critical features such as object flatness, surface angles, or part volumes, and are limited to contrast-based inspection. This makes 2D sensors a poor solution for scanning complex shape-based features on dark surfaces, or for operation in low lighting conditions.

In comparison, 3D sensors are contrast invariant and generate high-resolution scans regardless of the material or lighting conditions. They also capture the complete 3D geometry of the scan target, including critical depth measurements on surface features such as grooves in a tire tread.

Need for high-speed, high-sensitivity 3D

LMI offers Gocator 2430 and 2440 to meet this demand for high-speed, high-sensitivity 3D in R&T applications. Both sensors feature the latest optical technology.

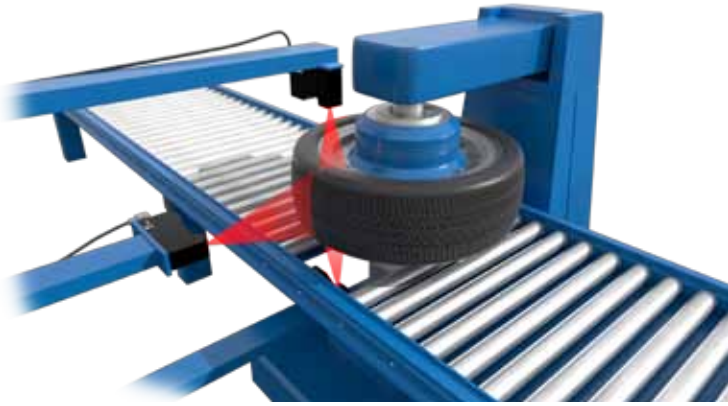
A next generation 2-megapixel imager delivers high-resolution profiles at 5 kHz —making them ideal for any high-speed scanning task, including tread/sidewall, rubber extrusion and more. Faster scanning allows users to speed up their inline process and achieve the highest resolutions.

The imager in Gocator 2430 and 2440 is twice as sensitive, which results in cleaner profiles (i.e., less noise and outliers), and therefore achieves better results on dark targets.

Other notable features of the 2430 and 2440 include a large FOV for wider scans and a compact new package with both top and side mounts built-in.

These sensors can be networked (a.k.a. buddied) to scan more of the target so the user can accomplish more with fewer sensors, while capturing fine surface and edge details. The Gocator 2400's measurement range covers larger depth variation and a wider variety of targets.

Gocator 2400 sensors are the smart 3D solution for R&T applications such as Tread profiling, Tire Uniformity, Gum strip lamination, Tire building drum, Rubber unroll, and Rubber extrusion profiling.



Combining 2D and 3D for specialised applications

Gocator smart sensors combine 3D and 2D technology in a single device to provide an effective solution for specialized R&T applications like identifying sorting code and DOT-Codes on tyre sidewalls.

The raised or embossed DOT-Code characters on the tyre sidewall are black on black, with effectively zero contrast. This prevents 2D machine vision from capturing the outline or edges of the characters.

To solve this zero contrast problem, 3D sensors generate point cloud data of the embossed characters and render them as a height map. The height map is processed by OCR algorithms common in machine vision libraries to extract the DOT-code.

Choose smart R&T inspection

Gocator's built-in user interface presents a fluid and responsive point-and-click experience using any web browser on any computer or operating system. With no additional software to install, Gocator is ready out-of-the-box to setup and measure critical dimensions in R&T applications.