

# L-Ray Selects Lumenera for its Next Generation of Tire Testing Equipment

## L-Ray Looks to Design Next Generation Tire Testing Equipment

Michigan based L-Ray designed the Differometric Digital Tire Test Machine, the next revolution in tire testing equipment. The Differometric was based on over 30 years of research and experience to produce a machine capable of safely and efficiently testing tires at high volumes and speeds.

L-Ray found themselves up against several challenges, including lengthy tire testing times, high production costs, space constraints, and difficult to understand results. Testing a tire through the conventional standard using shearography – a technique developed more than 25 years ago, could take up to 20 minutes and cost as much as \$10 per tire. Additionally, shearography produced confusing, hard-to-interpret results because all tire anomalies (when the layers or plies of a tire separate) appeared as laterally displaced images and could not be deciphered. In order to succeed, L-Ray required a new, non-destructive system that promised to quickly and inexpensively test tires.

## Megapixel USB 2.0 Cameras Implemented to Take Precise Pictures

L-Ray required an imaging component capable of rapid motion imaging and easy-to-interpret, precise pictures. For this challenging implementation they chose a Lumenera megapixel USB 2.0 camera with a CCD sensor.

L-Ray selected Lumenera because the cameras were able to meet all of the following needs:

- **Significantly reduce testing time:** Use the latest technology available, including Lumenera's high quality and performance cameras, cut testing time down from 20 minutes to 60 or 70 seconds.
- **Dramatically reduce costs:** testing cost are down to less than 50 cents compared to the \$10/tire in past. When development of the new tire tester began in 2000, the cost of components was around \$100,000. A sharp drop in the cost of today's advanced solutions has brought down the component cost to just a few thousand dollars.



**L-Ray Differometric Digital Tire Test Machine  
Featuring Lumenera CCD Camera**

## Highlights

- L-Ray works to produce a machine capable of safely and efficiently testing tires at high volumes and speeds.
- Required an imaging component capable of rapid motion imaging and easy-to-interpret, precise pictures.
- Lumenera's megapixel USB 2.0 camera with a CCD sensor was capable of meeting all L-Ray's needs.
- L-Ray has improved the tire testing process with the help of Lumenera's digital camera. The camera is able to provide results in "real-time" and easily interpreted by a technician.



- **Easily interpreted results:** Through the use of proprietary algorithms, installing 4 cameras instead of just one, and 16 laser diodes instead of a single light source, test results are easily understood by a technician.
- **Meet tight system space constraints:** Lumenera's small form-factor allows for 4 cameras to fit inside a tire. Thanks to carefully designed optics, each camera is capable of capturing precise images of the inside of one tire quadrant, although the cameras are only the size of a deck of cards.
- **High quality images for precise analysis:** Through Lumenera's high quality images, the tire-testing machine is able to display results and single out any anomalies, specifically where the anomaly actually lies, as well as its size and intensity. The differences between images are processed by algorithms into an easy-to-comprehend output, and allows for the automated rejection of defective tires.
- **Real-time results:** With the improved use of optics, light and reflection, this machine utilizes a digital CCD camera where results are provided in "real-time".

### L-Ray Deploys Differometric Digital Tire Test Machine Featuring a Lumenera Camera

After years of development and several million dollars in expense, the Differometric Digital Tire Test Machine was finalized and deployed. This tire testing process is the future for both factory floor and laboratory tire testing. L-Ray has improved use of optics, light and reflection, using Lumenera's digital CCD camera. The camera is able to provide image results in "real-time" that are easily interpreted by a technician.

Lumenera's Lu105m-CS-WOIR camera used in the Differometric Digital Tire Test Machine



#### About Lumenera

Lumenera Corporation, a division of Roper Technologies, headquartered in Ottawa, Canada, is a leading developer and manufacturer of high performance digital cameras and custom imaging solutions. Lumenera cameras are used worldwide in a diverse range of industrial, scientific and security applications.

Lumenera solutions provide unique combinations of speed, resolution and sensitivity in order to satisfy the most demanding digital imaging requirements. Lumenera customers achieve the benefit of superior price to performance ratios and faster time to market with the company's commitment to high quality, cost effective product solutions.

For further information about Lumenera, please visit [www.lumenera.com](http://www.lumenera.com) or call 613-736-4077.

