

## LUMETRISCAN™ TUBING MONITOR: ONLINE TUBING MEASUREMENT SYSTEM



### **OVERVIEW**

Lumetrics® provides a, non-contact, accurate, easy to use system, without the need for water, that provides Inside Diameter, Outside Diameter, wall thickness, concentricity, ovality, and more online tubing measurements. The LumetriScan™ Tubing Monitor Multi-probe measurement system is the industry leading solution to provide R&D, Production, and Quality a tool to improve yields, reduce costs, improve quality, and better satisfy stringent FDA requirements.

LumetriScan™ Tubing Monitor is a solution that is tailored to production line use with all the requirements for simplicity and data integrity the manufacturing environment requires. Additionally, it provides the flexibility required by Research & Development engineers to solve complex product development issues. The system currently comes with one to four probe configurations ideal for most single and some multi-lumen tubes. The package comes complete with the OptiGauge™ measurement system, the required probe(s) for the application, and a full software suite to control all inspection and reporting needs.

LumetriScan™ Tubing Monitor was designed to:

- Allow flexibility in probe selection and use.
- Provide a method to load a scanning recipe that is customized for a given tube.
- Provide a system to take multiple optical probe measurements at various angular positions.
- Provide an inspection report summarizing data in accordance with the acceptance criteria for critical dimensions and including a pass/fail determination.

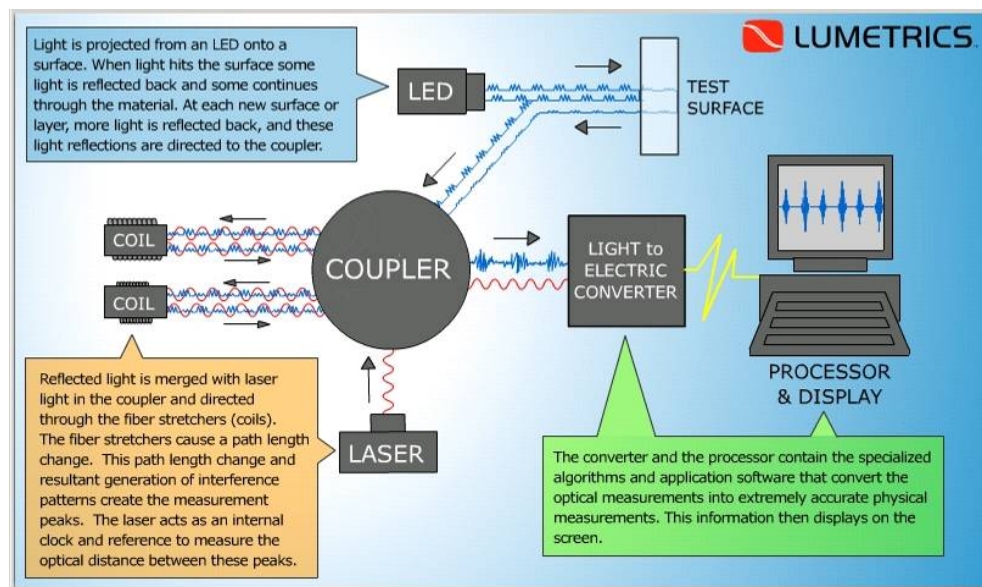
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LumetriScan™ Tubing Monitor not only provides simple measurements, but by obtaining immediate precise measurements the customer is able to implement process improvements that save money, improve yield, reduce scrap, provide better quality, and satisfy internal and external compliance issues. At Lumetrics® installations, customers have seen line startup times and product changes drastically reduced with the resulting improvement to their profit margin.

## TECHNOLOGY

The key to the LumetriScan™ Tubing Monitor's success is the underlying OptiGauge™ technology. The OptiGauge™ is an extremely robust infrared interferometer with an accuracy of 0.1 microns. The OptiGauge™ measurement technology has been perfected over years of work. Lumetrics® has installed hundreds of custom designed measurement systems in 6 of the top 11 medical device companies in the world and in dozens of smaller companies. It uses a Class 1 eye-safe 1310 nm LED to obtain reflections off of every surface it encounters - and can measure multiple layers simultaneously.

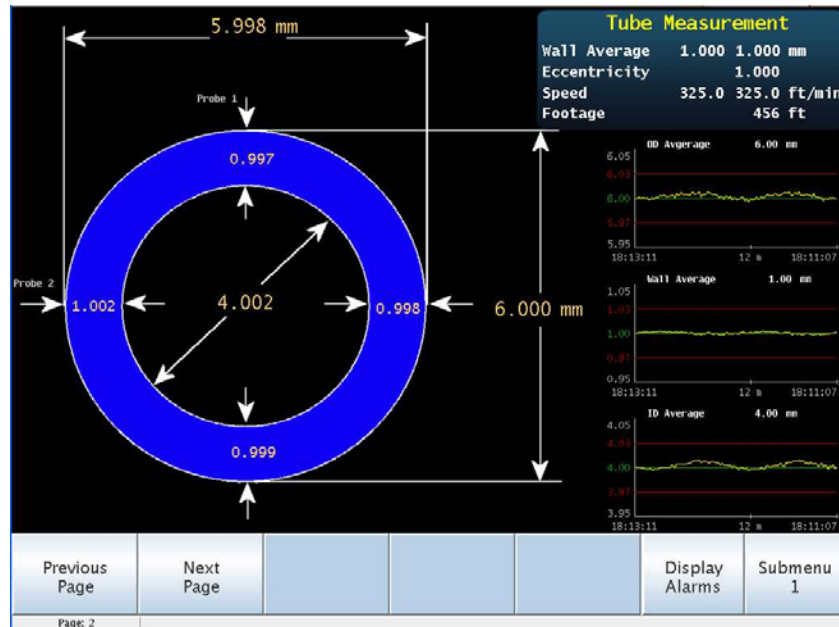


OptiGauge™ Technology

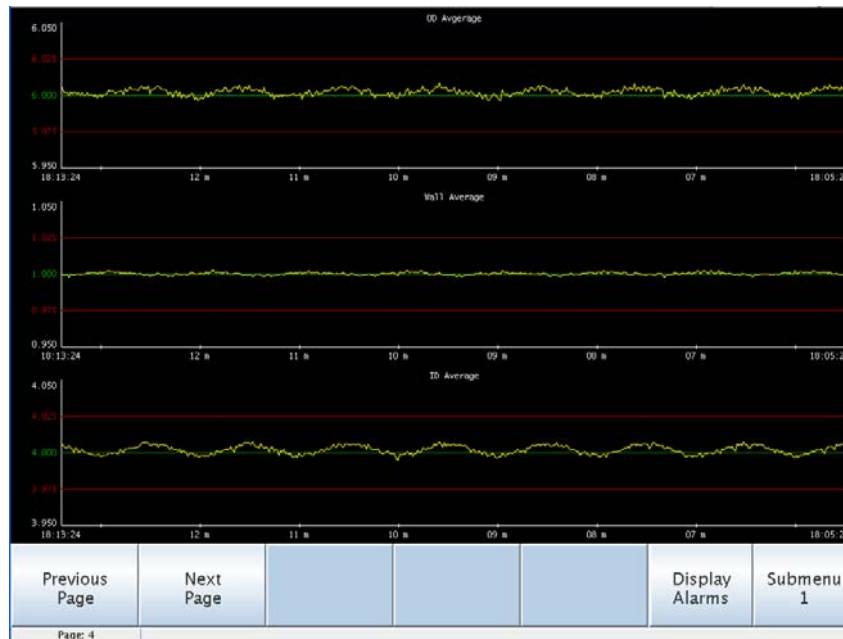
## SYSTEM SETUP

LumetriScan™ Tubing Monitor allows different tube configurations to be used to measure the required tubes. Small tubes can be easily measured with two probes at 90° angles to each other. For larger tubes four probes may be required to obtain the two IDs and ODs while also obtaining the four wall thicknesses. The system supports measurement of clear and colored tubing. The adjustable probe support structure quickly adjusts to various size tubes for rapid start-up of the tubing line.

LumetriScan™ Tubing Monitor provides a fully programmable menu structure to allow multiple measurement points around the product you are measuring with limited manual intervention. The probes just need to be perpendicular to the surface they are measuring. With the correct fixturing even some multi-lumen tubes can be measured. The system keeps track of standard measurements such as dimensions, concentricity, number of feet in the roll and speed. LumetriScan™ Tubing Monitor can also be tied into a full line and factory automation system that controls pulling speed, pressures, mix rates and more. This can be done in a gradual manner as the customers capabilities mature.



Typical run screen



Sample trend report template

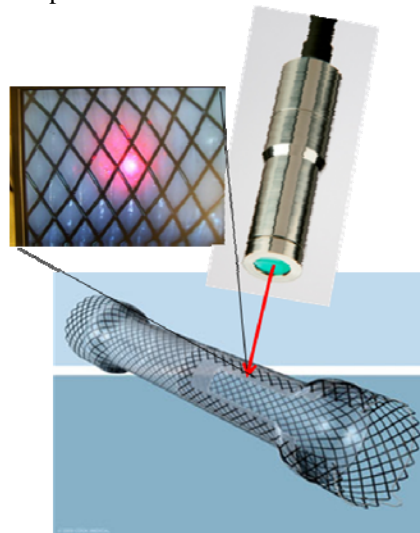
At the end of each cycle LumetriScan™ Tubing Monitor provides a full report and pass/fail indicators based on customer input. The flexibility of the report generator allows us to customize reports and screens for each customer or application. Our system provides error proof operation with automatically loaded menus, inspection criteria, and reports. No transcription errors or manual data entry, and standard software provides data integrity and transport to other network resources.

Tube Details					
Probe 1			Probe 2		
P1 Wall 1	1.000	0.996 mm	P2 Wall 1	1.000	1.001 mm
P1 ID	4.000	4.010 mm	P2 ID	4.000	4.004 mm
P1 Wall 2	1.000	0.998 mm	P2 Wall 2	1.000	0.997 mm
P1 OD	6.000	6.005 mm	P2 OD	6.000	6.003 mm
P1 Concentricity	100.0	99.8 %	P2 Concentricity	100.0	99.6 %
OD Average	6.000	6.001 mm	Footage	1000	244 ft
Max OD	6.100	6.007 mm	Speed	325.0	325.0 ft/min
Min OD	5.900	5.995 mm	Concentricity	100.0	99.7 %
ID Average	4.000	4.002 mm	Max Concentricity		99.8 %
Max ID	4.100	4.010 mm	Min Concentricity		99.6 %
Min ID	3.900	3.994 mm	Enable Average	<input type="checkbox"/>	
Wall Average	1.000	1.000 mm			
Max Wall	1.100	1.004 mm			
Min Wall	0.900	0.996 mm			
Previous Page	Next Page	ON	Change Setpoint	Display Alarms	Submenu 1
Page: 3   IT0124 - Concentricity					

Sample final report screen

### FUTURE IMPROVEMENTS

Work has already been started to add vision capabilities to inspect for defects during the cycle. The defects could be cataloged and recorded and data acquisition would be used in a pass/fail criteria.



Camera inspection capabilities

LumetriScan™ Tubing Monitor is the ideal tool for non-contact measurement of all single lumen tubes used by the medical industry. With the robustness and accuracy of the OptiGauge™ engine and the flexibility of the fixturing and data management, Lumetrics® is your preferred partner for tubing automation.

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