

For the extrusion process Freedom Technologies offers a complete line of rugged laser micrometers and systems. Our systems include basic monitoring, process regulation, and statistical analysis.

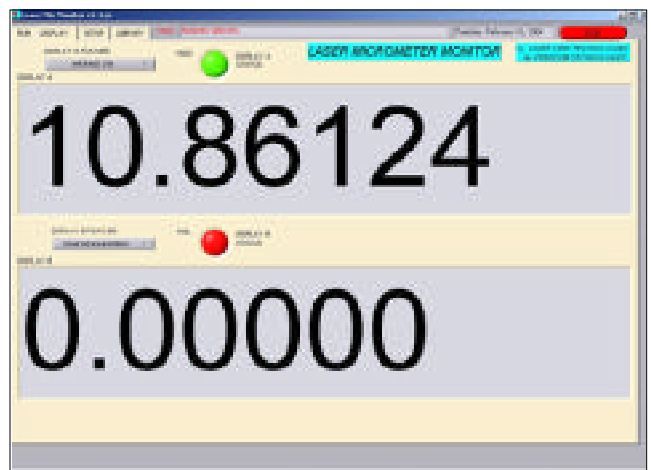
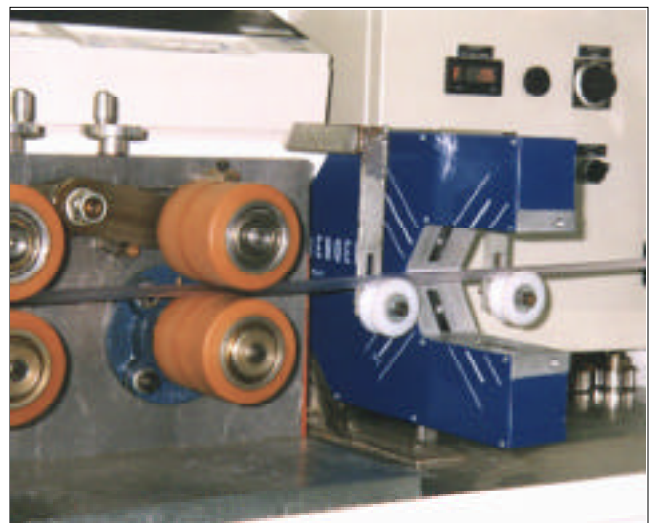
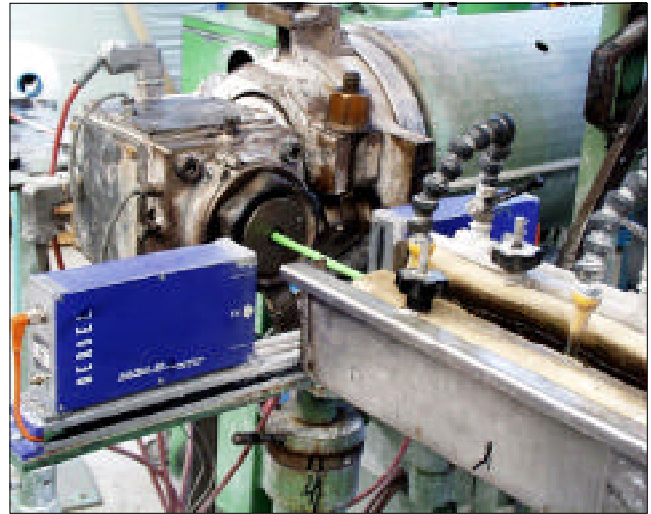
There are basically two configurations of laser micrometers which are generally used in the extrusion process. They are the Extruline series and the Xploreline series. The Extruline series includes process regulation as an option while the Xploreline series does not.

**The Extruline Series** - The Extruline series includes both single and dual axis laser micrometers. They are well suited for diameter control of extruded products such as plastic tubing and sections, electric cables, fiber optics and other similar products. The Extruline series provides the perfect balance between straightforward operation and advanced performance. An Extruline system includes a laser gauge head which connects to a separate electronic controller. All the application specific software is user installable in the controller. The Extruline series is ideal for the end user who is looking for a complete solution with process regulation in a prepackaged system.

**The Xploreline Series** - the Xploreline series also comes in both single and dual axis configurations. Because the Xploreline series is a complete system in the gauge head, it is attractive to the system integrator, OEM, or an end user. Frequently in situations where there are numerous systems involved, the Xploreline series offers the customer high performance with an attractive price. Built into the gauge head is a RS 232/485 and Ethernet interface. With our laser micrometer monitor software, the Xploreline can be connected to a PC running Windows. You can display a variety of measurements, Diameter, ovality, TIR, etc. The data can be sent to a text file and or Excel™. It also integrates with a variety of commercially available SPC software packages.

Photos from top to bottom are; an Extruline single axis gauge, an Xploreline dual axis gauge, and a screen from the laser micrometer monitor software.

## Laser Micrometers for the Extrusion Process



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### What are our Advantages?

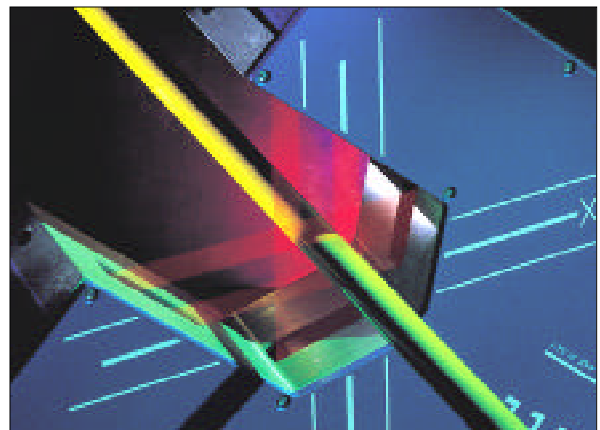
- **Straightforward operation:** guided menus ensure maximum ease of usage, even for an untrained staff. Due to the pre-programmed application specific software in the Extruline series, operation is immediate right out of the box.
- **Insensitive to product vibration:** our gauges can be installed immediately after the extruder head where the product is still warm and soft due to its insensitivity to vibration. The result is a faster and more effective regulation.
- **Efficient glass logic:** measuring glass pipes and medical tubing are easily accommodated with our extrusion process gauges.
- **Effective regulation even on ovalized product:** the dual axis (xy) makes it possible to achieve the optimum feedback, in spite of random product orientation.
- **High accuracy:** better precision makes it possible to work close to the lower limit resulting in increased material savings.
- **Reliability and long life:** the high standards of our components and solid state lasers enable us to offer a three year warranty.
- **Permanent Auto Calibration:** with every scan (200 or 1200 times per second) the laser gauge measures an internal reference edge. It corrects the part measurement based on the reference edge measurement. As a result, the gauge will never require calibration due to drift over its lifetime.

### What are the Benefits?

- **No scrap:** the real-time inspection allows the system to detect out-of-tolerance trends and return the product back within specification, avoiding any risk of rejects or complaints.
- **Material savings:** by keeping the product close to the lowest tolerance limit, considerable savings in materials are achieved yielding a fast payback.
- **Quality certification:** the 100% inspection makes random sample checks redundant and allows the printing of detailed reports to prove product quality.

### Our Performance

- **Measurement range:** measures the diameter and the ovality from 0.1 to 78mm (0.004 to 3.07") using single or dual axis (xy) laser gauges.
- **Regulation:** performs automatic extrusion regulation by keeping the product within tight tolerance limits.
- **Statistics:** detailed statistical reports are processed and printed for each spool.
- **Computer:** easily interfaced to a computer to download measured data or to allow remote system programming.



The closer you look, the better we measure!

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