Advances in technology have helped deliver several key test/analysis methods into the hands of maintenance professionals on the factory floor. These methods include the use of infrared and thermography; vibration analysis; ultrasound; condition monitoring software; and shaft-alignment systems.* While the test/analysis category also includes equipment designed strictly for test environments, its most significant momentum may be in **MRO**, where changes in product size, capabilities and ease-of-use have greatly enhanced maintenance-efficiency opportunities across industry.

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While most of the technologies named above are not new (infrared radiation, for example, was discovered in the early 19th century), the ability to **"package"** them in affordable, on-site, user-friendly equipment borders on the revolutionary. Maintenance professionals can now **"point and shoot"**
a hand-held, lightweight infrared camera toward equipment to obtain an infrared image and accurate in-use temperature data. With low-end models costing around $1000, the technology is affordable, and allows for quick updates of equipment status and PdM data. It's a far cry from the early days of industrial infrared when cameras were bulky, expensive and complex to operate. Thanks to advances like this, one research firm predicts a 23% annual growth rate for infrared at least through 2015.

Shaft-alignment and ultrasonic systems have also taken the user-friendly route. Hand-held **lase r shaft-alignment**
systems can evaluate hundreds of shaft-rotation readings in a continuous process, quickly

producing accurate readings. The modular systems are typically programmable, can store information and include high-resolution screens for easy-to-read graphics. Long understood as essential for equipment and component longevity and effectiveness, shaft-alignment procedures were often avoided or impossible due to poor access for bulky alignment equipment. Modern alignment systems now make this important maintenance function available to a broad industrial audience. Similarly, a wide offering of
hand-held ultrasonic units
for industrial purposes use high-frequency sound waves to detect various equipment conditions, especially leaks in compressed-air systems and condensers. One maker claims that the ease-of-use and affordability of their products equate to “predictive maintenance for the masses.”

Condition-monitoring software is another sector where offerings have become highly sophisticated and robust. Thanks in part to the many big players in this sector, significant advances in software capabilities are routine, with implementation and ongoing assistance typically part of the mix. With condition monitoring software, maintenance teams and production engineers have 24/7 access to a spectrum of real-time system perspectives (performance, variation, reliability, work-order progress, etc.), as well as equipment histories and scheduling information. This and all other sectors in the test/analysis category are well-positioned to serve MRO markets going forward as the industrial environment continues to skew toward ever-leaner operations and higher expectations for productivity.

Rick Carter, Executive Editor

**Definition determined by Maintenance Technology editorial staff.*

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