

Coordinate Measuring Machines

For many companies, a coordinate measuring machine is at the heart of the operation. For years, these multifunctional tools have ensured the accuracy and reliability of products all over the world. Improvements to CMMs, such as more intuitive software, higher precision and greater affordability, have made these machines musts for most any organization interested in maintaining the quality of its product.

CMM technology is in a state of constant development, but there are a few standard features that anyone seeking a CMM should keep in mind. Software that accompanies your CMM should be graphically driven and capable of storing and retrieving data. This is an area that will continue to become more user-friendly, affordable and standardized.

Accuracy is another area of CMM technology that's improving at a rapid pace. CMMs are now capable of accurately measuring dimensions into the five-micron range. Temperature-compensation features allow CMMs to be located not only in a lab, but now on the shop floor.

CMM operators have changed as well. When once the CMM operator was a quality engineer, there's now a more eclectic assortment of CMM users, from manufacturing engineers to technicians working midprocess during production.

The Quality Sourcebook's CMM Guide features information on about 120 CMM manufacturers and distributors. Our guide includes a number of video- and laser-based products in addition to

traditional CMMs. As new technologies arise, look for more of these nontraditional CMMs. Laser- and vision-based machines are performing CMM functions in places that CMMs can't reach and on very large objects.

Because the world of CMMs is constantly evolving, stay on the lookout for future *Quality Digest* articles discussing the latest developments in CMM technology.

CMM Guide

CMM Manufacturers Directory.....42

This directory of CMM manufacturers includes the company name, address, phone and fax numbers, and Web address. For a brief description of the company's products and services, visit www.qualitydigest.com/directories. (Please note that not all companies provided us with descriptions.)

As with all *Quality Digest* guides, the CMM Guide is in no way meant to endorse or exclude a particular organization. Rather, it's meant to be used as the starting point in the data-gathering process. Readers are encouraged to contact the companies directly for more information and to ask for—and check—references.

We appreciate any feedback you have on our CMM Guide. If you have any suggestions on how we can improve this guide for next year, e-mail them to sourcebook@qualitydigest.com.

Glossary

Linear accuracy—accuracy of the instrument when measuring along a single axis. This data is often integrated with the volumetric accuracy.

Range—the X, Y or Z distance the CMM can travel while measuring a part. For articulating arms, the laser trackers and other nontraditional CMMs, this dimension may be represented as a sphere.

Resolution—the smallest distance that can be measured by the instrument

T comp.—many instruments provide a means for temperature compensation. Temperature data can be manually input, read from a sensor mounted on the part being measured, read from sensors mounted on the instrument itself or any combination of these.

Throughput—describes how many points per minute an instrument can measure. This number tends to be much higher for noncontact measurement systems than for contact measurement systems.

VDI, B89 or ISO—accuracy standards to which instruments conform

Volumetric accuracy—accuracy of the instrument when measuring along all axes simultaneously

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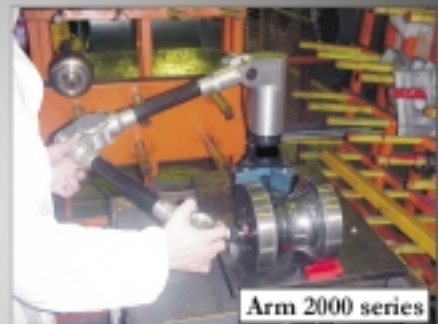
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Exposition: Wednesday–Friday, February 19–21, 2003

Conference: Tuesday–Friday, February 18–21, 2003

Anaheim Convention Center • Anaheim, CA

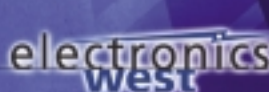
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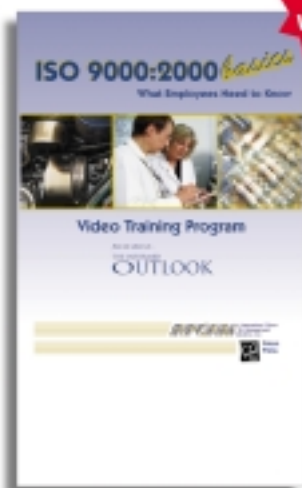


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ISO 9000:2000 Basics



What Employees Need to Know

This video package introduces ISO 9000:2000 to any of your employees who need a basic understanding of the new standard's requirements. In addition, the video's learning guide provides additional information, gives viewers space for taking notes, asks questions to stimulate thinking and has a quiz to test viewers' retention of material (extra learning guides may be purchased). The video is ideal for use in a classroom setting or for training individuals.

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The Idea Generator— Quick and Easy Kaizen

A Powerful One-Day Program at Your Facility



The Workshop Leader

Norman Bodek has led 50 industrial study missions to Japan. Through his publishing company, he discovered, brought over, translated and popularized many of the Japanese quality tools, techniques and technologies that transformed U.S. industry in the mid-1980s. Norman puts on a highly rated workshop. Recently, Bodek co-authored (with Bunji Tozawa) *The Idea Generator: Quick and Easy Kaizen* (available from QCI International).

The Workshop

How do you motivate all employees to submit lots of creative improvement ideas to improve customer service, improve quality, reduce cost, improve safety and reduce the time it takes to deliver products and services?

This workshop will teach you how to effectively simulate and manage a revolutionary idea system: The employee that comes up with the idea implements it. This is not a suggestion system in which someone comes up with an idea for someone else to install. This system is not an additional burden to management.

Don't depend on your supervisory and engineering staff to do the kinds of things that happen with *Quick & Easy Kaizen*. They just don't have the time. They are already swamped with other major challenges. Furthermore, they often don't recognize the myriad improvement opportunities because they aren't the hands-on experts in all of the processes, great and small, that take place throughout your company.

Don't depend on your suggestion program. The typical program is geared for the big stuff. Most workers don't even try. In the United States, the average employee submits only one idea every seven years—an incredible waste of talent, capability and experience! Compare that with employees at a company using *Quick & Easy Kaizen* where typically each person contributes and implements (whenever possible) two improvement ideas per month!

The workshop is a half-day affair. In addition, Norman will meet with various groups to help forge a strong, vital and enduring implementation plan.

To schedule a workshop at your location, contact:



QCI International

Tel: (530) 347-1334

Fax: (530) 347-6987

E-mail: info@qci-intl.com

Web site: www.qci-intl.com