

Resource Review—



Jason Sommers, foreground, uses a Creaform wireless CMM to check an aerospace part. Yoichi Mizutani, quality manager, far left, measures a medical part using the optical probe on a coordinate measuring machine. Jack Nguyen, right rear, uses a contour tracer to measure a 2D profile. Middle rear is John Lyons using a form tester to check the cylindricity of a valve body.

Faith in Quality Pays Off

A Young Entrepreneur Loved Quality So Much He Founded His Own Company.

Story and photos by C. H. Bush, editor

Mike Knicker got his first “inspection” job at age 17 while he was still in school. He instantly fell in love with the notion of quality control, saying he innately understood its importance. Over the next eight years, Mike worked in QA at several different shops, and at one of them became general manager. In that job he learned the basics of business, but even as general manager, he haunted the CMM room, he says.

Knicker: “It was a small company, and when they had a tough CMM programming job, I rolled up my sleeves and did it myself. I loved the whole notion of quality control and just couldn’t stay away from it. I still do.”

After eight years in the industry, Mike founded Q-Plus Labs, eventually growing to offer a wide variety of quality related products and services. Q-Plus is now 23 years old, occupies a modern, 6,500-sq-ft facility in Irvine, CA and employs 12 technicians to serve a broad range of customers in the metalworking and other industries. Q-Plus Labs is both ISO 9001 registered and ISO 17025 certified.

CNC West recently visited Q-Plus Labs to interview Mike Knicker. The result of that interview is presented herein.

C.H. Bush, editor

CNC West: Mike, thanks for taking the time to tell our readers about Q-Plus Labs.

Knicker: My pleasure, Chuck. Thanks for coming.

CNC West: You have a really well equipped facility here. Tell us what you can do for our readers.

Knicker: Basically we categorize ourselves as a precision dimensional measurement laboratory, but we do a lot more than dimensional measurement. We provide a pretty broad selection of inspection, engineering, and quality-related products and services.

Inspection Services

CNC West: Such as?

Knicker: Well, in detail it’s a pretty long list, so I’ll first give you the main categories. For instance, we perform dimensional inspection, reverse engineering, 3D scanning, calibration and consulting. We also sell and service a broad line of quality-related products for when our customers reach a point where they want their own equipment in house. At that point we can consult with them and make suggestions.

CNC West: I see. I know what some of those services are and some I don’t. Perhaps you’d better explain them to me.

Mike Knicker, left, and lab manager John Michael Lyons discuss requirements for a product to be tested on a Mitutoyo CMM, background.

Knicker: Sure. Our dimensional inspection services are also known as metrology services, validation, verification, product evaluation, contract inspection and layout inspection. We perform those services to compare the actual condition of a manufactured part or component to the nominal condition as defined by engineering drawings and blueprints, metal or film templates, digital files and 3D CAD models, or even a master tool or part. Basically, we can check virtually any kind of part to be sure it meets customer dimensional specifications. And, of course, we can provide any kind of report they need.

CNC West: I see a lot of equipment here. Is that what most of it is used for?

Knicker: Yes, most of it. We do first-article inspection, DCC-CMM full automated inspection, non-contact inspection, contour analysis, both 2D and 3D, surface finish analysis and form and roundness testing. To do all that you need a lot of equipment. We have eight CMMs and VMMs, including Mitutoyo, Starrett, Werth, multiple sensor and DCC. The multiple sensor system has both touch probes and laser scanning. We have white light scanning and laser scanning. We have a purpose-specific form tester out there that's extremely accurate. It measures roundness, cylindricity, flatness, straightness at a whole order of magnitude more accurately than a CMM.

CNC West: I thought I saw a Faro Arm, too.

Knicker: Yes, you did. We use that to measure parts too large for our CMMs, and we also take it to the customer's site, wherever that may be. One of our guys just returned from doing a job in the bay area, for example.

CNC West: So, the bottom line is you can inspect just about anything. What about reverse engineering?

Reverse Engineering and Solid Modeling

Knicker: Well, we like to think of that as bringing parts back to life. We do reverse engineering using all the standard



methods, such as laser scanning an old product; But if the customer has an old drawing, we can do something even better. For example, suppose someone has been asked to make a spare part for an old plane from a drawing from the 60's. And they no longer have anyone in the shop who can interpret that old drawing. Or it may compromise quality to not work out the details up front before they cut metal. So they'll send us that drawing and actually have us build the 3D CAD model that never existed to begin with. If there's enough data to build the part then there's enough data to build the 3D CAD model, too. Now they can build the part from the 3D CAD model with a much higher confidence than if they were working from an old blueprint.

CNC West: I've written about reverse engineering before. Pretty fascinating stuff.

Knicker: Yes it is.

Calibration Services

CNC West: You mentioned calibration services. You calibrate machines?

Knicker: Yes, but we also calibrate check fixtures, master tools and other unconventional gages. We calibrate all types of check fixtures, including targeting fixtures for castings, clam-shell gages for aerospace components, contour gages with go-no-go gage balls and, of course, we also design gages and check fixtures ourselves. We provide comprehensive reports and analyses for master tools and templates such as those used in the aircraft industry, for tracing and duplicating machines, matrix tools for compressor and turbine wheels, and complex optical lenses. We do complete and detailed spline gage



Lab manager John Michael Lyons uses a Starrett AV350 multisensor CMM. Jason Sommers works at an optical comparator.



Brian Degraffenreid, Q-Plus inspector, uses a Faro Arm equipped with a laser scan head attachment, to get dimensions on a component used in power generation. Q-Plus also uses the Faro Arm to do on-site work at customer locations.

calibrations, including extremely accurate MOW (measurement over wires) or MBW (measurement between wires) as well as involute form verification and plots. I warned you, Chuck. It's a long list.

CNC West: Yeah. I'm beginning to believe you, Mike. What about your consulting services?

Consulting Services

Knicker: We provide a variety of in-house and on-site consulting services. Mainly we can help clients solve quality-related problems, ranging from determining the right instrument for measuring to instituting a complete ISO 9001 quality system. Our consulting is geared primarily toward implementation of ISO 9001 for smaller businesses that need economical yet effective assistance in establishing or improving their quality systems. Over the years we've been there and done so much that we have most solutions right at our fingertips. Our consulting is very customized, so the best thing is to give us a call to decide on the right approach.

CNC West: I know you don't push the products you sell, but I think our readers might like to know what kinds of things you have to offer.

Knicker: Well, since we use a lot of equipment to make our living, we're pretty picky about it. If a customer calls us about what equipment he needs for an application, we don't just recommend the things we sell. We look at his needs and

recommend what we think is the best solution for him. Since we have a full array of products and services, we can provide unbiased recommendations.

CNC West: But what kinds of equipment do you handle?

Knicker: We offer multi-sensor vision systems, CMMs and DCC-CMMs, 3D scanners, rapid prototyping software, optical video probes, optical comparators, precision hand tools, articulating arms, high-accuracy form and roundness testing equipment. Like I said, no pushing. We choose the best solution to the problem to recommend. Shall I go on?

CNC West: (laughing) Not necessary. I got the idea. I have a final question. What if someone needs a fast response? Can you do that?

Knicker: We do it all the time, but, of course, response time depends on the work needed. We always try to meet expectations. If we say our average turnaround at a given time is four to five days, and the customer needs two to three, we try to re-adjust to meet that. We can work around the clock if necessary.

CNC West: So after thirty years working within the quality field, are you getting bored yet?

Knicker: Not on your life, Chuck. I've loved this field from day one. I've always had faith that quality pays big dividends. That's true for me, and it's true for our customers. ■