



◀ ProTables are placed strategically throughout the shop. Here the part profile is checked using a 12-inch ProTable. Source: Crane Plastics

# Quality Over the Net

Crane Plastics (Columbus, OH) had all but exhausted their efforts in trying to locate linear digital measurement devices in the market. They needed to be able to meet and even exceed the quality parameters their customers demanded for length requirements in extruded plastic products. Over the past few years, tolerance issues have become more critical among customers' requirements, says Bob Mullens, Crane's senior lab technician. He considers the glass scales used to measure these tolerances old technology that is too expensive to repair and maintain. Thus, it was necessary for Crane to find a method of linear measurement to satisfy customer needs. What they found changed their production and virtually eliminated all customer complaints.

Crane Plastics is a custom profile extruder. They work with customers' designs and help them select the right material for the application, whether it is for interior or exterior use, UV

stabilized, consisting of any number of 150 color choices or any other number of variables. The company specializes in the custom side of the business and they build tooling to the customers' designs and specifications with input and recommendations from Crane's engineering staff. Crane is known for expertise in color matching and their ability to hold tight tolerances for color control.

"Our second most differentiating trait is our strict attention to length control," says Joe Ewing, Crane's director of sales and marketing. "We thrive on providing parts for our customers to critical length tolerances in 18 inches up to 12-foot lengths."

What the QC team at Crane found on the Internet for linear measurement was Accurate Technology Inc. (Fletcher, NC). Accurate offers various products to measure linear dimensions in fractions, metric and inches. Crane chose the ProTable product to

solve their measurement problems. "As far as linear measurement, there's not a whole lot out there," says Mullens. "The ProTable from Accurate is something we found four years ago and we liked it so much we bought 12 more."

Every customer product at Crane starts out as a thermoplastic resin heated up to 375 F, extruded through a tool specifically designed to the customer's part. It comes out the other end still warm. "Everything expands and contracts when it goes through a temperature gradient," explains Ewing. "In our industry we spend a lot of time with the coefficient of expansion and contraction. We are able to predict the final length of the product at any given temperature to determine the final set. We can pinpoint, with the use of infrared guns, what the final shrink will be."

Based on the temperature of the parts, manufacturing can refer to the supplementary length tables, designed by Crane's engineering staff, and know what length the part needs to measure at that given temperature.

Before they added the ProTables, operators had to use tube micrometers and individually set them to the correct thousandths, add extensions and hope that the operators could set the micrometers correctly. "Length has always been one of our biggest quality concerns since I've been here," says Mullens, a 15-year veteran.

ProTable allows Mullens' team to eliminate the tube micrometers, which removes the possibility for the operators to set the wrong length. The operator can now read the length from the ProTable's digital readout and get the precise measurement at that point in the process. "The ProTable removes a lot of the old procedures and we are now getting much better accuracy," says Mullens.

## BENEFITS

▶ Customer tolerance issues and the addition of SPC computers have driven Crane to improve their statistical analysis procedures and documentation.

▶ ProTables have been a major step in Crane's quality improvements by minimizing errors and eliminating the problems they were encountering with the tube micrometers.

▶ After adding ProTables throughout the facility, the number of customer complaints from any length issues have decreased at Crane and scrap rates are much lower.

Another benefit is the convenience of placing these units next to the extruders. According to Mullens, the parts want to shrink rapidly and the sooner they can get them off the line and measured, the better they can determine what is going to happen to the length as they cool. Now they can take the extrusion off of the line, put it into the ProTable and get an instant, accurate measurement.

Mullen says the ProTables have been a major step in their quality improvements by minimizing errors and eliminating the problems they were encountering with the use of the tube micrometers. "With the Accurate product we've eliminated those problems and the deviations in measurement have been removed."

Ewing concludes, "There is no question about it, after adding ProTables

throughout our facility the number of customer complaints from any length issues have all but evaporated, and our scrap rates are way down."

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## **CUSTOMER DRIVEN**

Both Mullens and Ewing agreed that Crane's quality parameters have reached a higher level. Customer tolerance issues and the addition of SPC computers have driven Crane to improve their statistical analysis procedures and documentation. The need to control the product through manufacturing is more important today than ever before. Mullens says, "It's a competitive world out there and anything we can do to get an edge over competition, we want to do it."

Some customers want Crane to hold  $\pm 0.031$  inch on length—lengths up to 12 feet—and maintain a consistent product run-to-run, order-to-order. "Let me say it this way, the Accurate ProTable allowed us to meet and exceed those customer expectations," says Ewing. "In the past we had higher scrap rates, calling out the longer parts here or issues with customers having problems at their end. But the ProTable has removed those issues from our quality problems."

With nine ProTables in the plant and four more on order, all ranging from 4- to 12-foot measuring range, each one is equipped with an SPC-RS232 converter or RF transmitter capable of sending data to the computer for tracking and logging statistical data. According to Mullens, the ability to chart length variables via Northwest Analytical allows Crane to see a quality histogram of the complete run and where the parts ran lengthwise in regards to set parameters. Customers rate their suppliers based on parts per million, returns, rejects, on-time deliveries and complaints. Crane rates well because they believe that if they send every order out that meets or exceeds the customer's expectations, they greatly increase their odds of receiving new business and keeping their current customers.