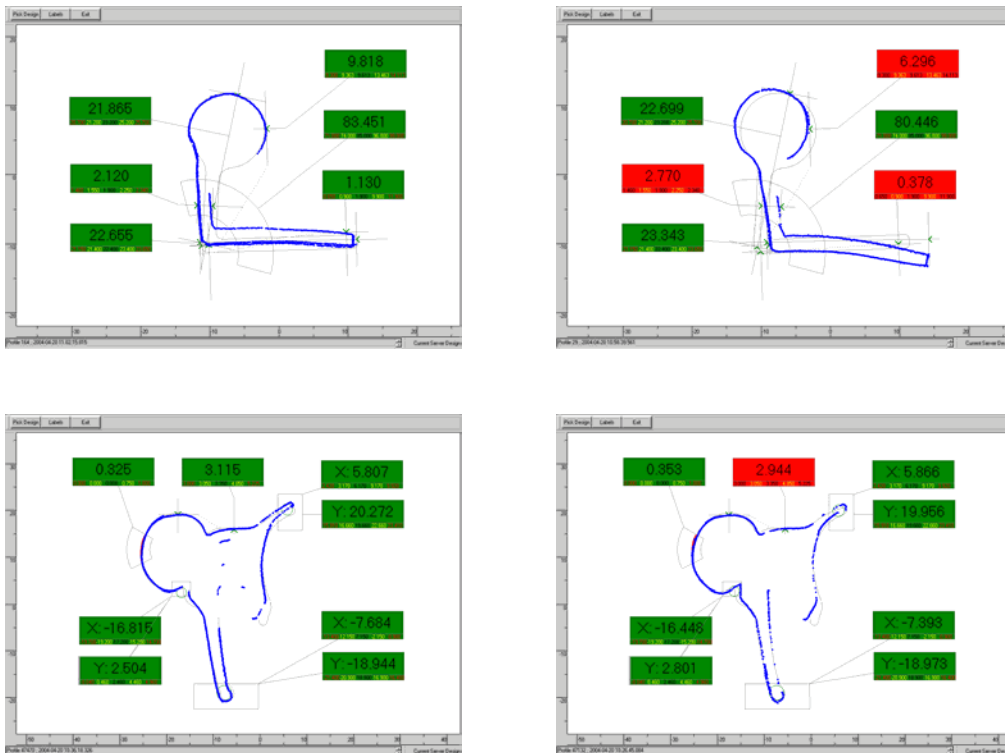


On-Line Profile Measurement Solves “Bulb Lean” Problems For Carlisle Engineered Products

Carlisle Engineered Products, Middlefield Ohio, put the Bytewise Profile360 on-line profile measurement system to work in mid-2003 and immediately recognized a major cost reduction and quality improvement goal. Carlisle makes a truck engine compartment seal from extruded profiles joined with molded corners in a secondary molding operation. They experienced high scrap rates at molding due to variations in the extrusion geometry. Extrusion ends that were too large or too small didn't match up with the corners, and parts were scrapped after molding. Profile360 was set up to monitor the key dimensions. The line operators used the trend display to see how these dimensions behaved, and adjusted the extruder and downstream equipment to keep the dimensions properly centered. By monitoring a critical “bulb lean” parameter, both extrusion scrap and molding scrap were reduced. Furthermore, molding labor became more efficient as rework was avoided. The result was a \$2000 per month saving for one part that was running only a few days per month. The resulting \$25 per hour savings extrapolates to a potential of \$200,000 per year for one instrument.



Examples of “Bulb Lean” for a Seal, with good parts on the left and bad parts on the right. On-line monitoring permits Carlisle operators to adjust the process to eliminate bad profiles and reduce molding scrap.

According to Brian Thornburg, Extrusion Engineer at Carlisle “Profile360 is like a real-time optical comparator. Our operators can glance at the screen and determine immediately what’s going on with our extrusion process. The printed reports provide a

simple communication tool that gives our customers confidence in the quality of their parts. Furthermore, measurement history logs can be recorded and analyzed to get a good understanding of changes in the process.”

Profile360 is an on-line, non-contact profile measurement system produced by Bytewise Measurement Systems. Profile360 employs four laser profile sensors to gather over 4,000 measurement points characterizing the outside profile shape of an extrusion at rates up to five complete profiles per second. There are no moving parts. Profiles are compared to CAD templates created in AutoCAD, and are presented to the operator as a real-time optical comparator. Key parameters are measured using “virtual calipers”, that emulate micrometer calipers. Measurements are compared to control limits and displayed as real-time results. All measurements are viewable as trend charts that show the measurements along with the control limits. Measurements are displayed with red, yellow, and green backgrounds to indicate whether they are out of specification, in the warning zone, or within specification. The red and yellow status indicators alert operators to adjust the process to keep dimensions properly centered, thereby assuring compliance with dimensional quality standards.



Profile360