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Students Learn How 3D Laser Scanning Improves Production

To help its students acquire the expertise that prospective employers like to see, a British university brings in technology from Z Corp.

24

28

A new face mill from Mitsubishi Carbide delivers productivity economically in cast-iron machining work.

Uddeholm develops a new grade of stainless steel to set a higher standard for machinability

45

IN THIS ISSUE

English University's Consulting Project Shows How 3D Laser Scanning Can Improve Production Performance

Engineering education excels when students don't just learn about today's technology but acquire the advanced expertise prospective employers like to see. This is why the University of Sunderland in northern England brought high-resolution **3D laser scanning technology** from **Z Corp.** to its Digital Factory, a training and technology transfer project delivered by the school's Institute for Automotive and Manufacturing Advanced Practice and centred around digital engineering technologies.

The Digital Factory's students and professional consultants supply businesses in the northeastern UK with technical training and support in computer-aided design (CAD), engineering, and rapid prototyping. For example, the Digital Factory team recently helped 3M UK plc improve manufacturing accuracy and reduce costly waste at its respirator plant in Aycliffe.

"We had a long list of demanding requirements for our 3D laser scanning technology, and the ZScanner™ 700 from Z Corporation was the only one that met them all," explains Sajid Abdullah, lead consultant with the Digital Factory, who adds that "it was the perfect tool for the 3M project."

3M was struggling with a manufacturing glitch: foam breathing filters to be fitted inside the respirators' breathing modules were emerging from one of two production lines out-of-spec, preventing some masks from being assembled properly. Units were scrapped, materials wasted, and time lost.

To solve the problem, the Digital Factory team used the handheld ZScanner 700 to scan four pairs of tooling and some moulded-plastic mask units, and Geomagic® Qualify software to compare scan data against theoretical dimensions in CAD drawings. The work revealed a flaw in one set of tooling that, Abdullah asserts, neither the naked eye nor a 2D scanner could have caught. The solution was to scan the defective tool's properly functioning counterpart and then use the data to digitally machine a properly dimensioned clone. A half day of scanning saved 3M a lot of time and money and dramatically improved productivity.

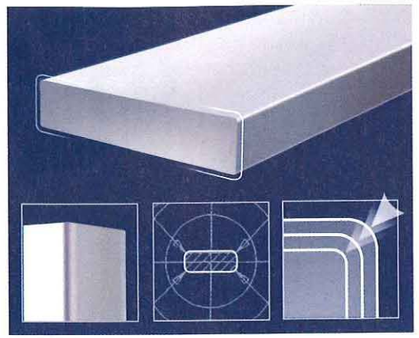
Traditional inspection methods are time-consuming and costly. "However," says Fraser Shearer, 3M senior manufacturing technologist, "by using the latest digital technologies available from the Digital Factory, including their laser scanner, we achieved 3D measurements in two days without any factory downtime." He believes a high-cost consultancy would have taken two weeks to find and fix the glitch. "This project has really helped us improve our working practices," concludes Shearer.

The university had evaluated scanners from several manufacturers but found the self-positioning ZScanner easiest to use. Notes Abdullah, "It requires no turntables or tripod-like fixtures as the others do. You just hold the scanner in your hand, swipe it across the surface of the object, and let the lasers lock on."

The ZScanner's portability means that the Digital Factory can take the tool to its industry partners' facilities—as well as share it around the university's engineering department. The device is suitable for digitizing large objects and hard-to-reach areas. It was the only solution Abdullah found that included reverse-engineering software to capture and repair point cloud data.

Z Corp.
BURLINGTON, MA, USA
www.etmm.info/2009/06/032

Close-Tolerance Ejector Blades Result in Burr-Free Moulded Parts without Custom-Component Costs



Eberhard GmbH & Co. KG is a major manufacturer of **standard and special mould components**, providing mould makers with rapid, cost-effective access to a comprehensive range of stocked standardized parts covering all dimensions and materials. Specified customer requirements do not always call for custom-made components; sometimes a standardized part can be utilized as a blank.

Once, for example, Eberhard helped out a company unsatisfied with the quality of its previous supplier. Deficient contour tolerances continually caused the customer problems with ejector blades—specifically, impermissible burr formation on injection-moulded parts.

Eberhard uses a special flat grinding process to manufacture the lug of standard ejector blades. As a result of this production method, the flat lugs remain within a narrow tolerance band with reference to both mass and shape. In the case at hand, the customer required extremely precise corner radii. Eberhard chose for this application ejector blades that offered a 0.002-mm plus-tolerance at the blade. A system of precise tolerances with respect to the corner radii has resulted. The ejector blades can be installed without fitting work.

Jamming is ruled out, as the radii are produced with a plus-tolerance. An even and narrow contour tolerance of under 0.01 mm makes possible burr-free injection-moulded parts.

For dimensions below 1 mm, Eberhard produces ejector blades from high-speed steel (HSS) because of its higher pressure resistance. HSS is a superior choice even for processing abrasive or gas-producing materials such as Duroplast, fibreglass blends, or POM. Its maximum tempering resistance of 560°C enlarges the application range in terms of processing and coatings.

Eberhard GmbH & Co. KG
NORDHEIM, GERMANY
www.etmm.info/2009/06/034