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OPTODYNE ANNOUNCES: NEW TECHNIQUE IN 3D VOLUMETRIC POSITIONING ERROR COMPENSATION

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3D Volumetric positioning error compensation – Measurement over the part and compensate the G-code

RANCHO DOMINGUEZ, CA—AUGUST 25, 2009—Optodyne Inc., the leader in laser measurement, calibration and compensation systems, today has announced new technique in 3D volumetric positioning error compensation of CNC machine tools by measurement over the part and compensate the G-code. Hence, a low cost CNC machine can perform as a high cost machine, provided the machine is repeatable.

Twenty years ago, the largest machine tool positioning errors are lead screw pitch error and thermal expansion error. Now, most of the above errors have been reduced by better lead screw, linear encoder and pitch error compensation. The largest machine tool positioning errors become squareness errors and straightness errors. Hence, to achieve higher 3D volumetric positioning accuracy, all 3 displacement errors, 6 straightness errors and 3 squareness errors have to be measured. Using a conventional laser interferometer to measure these errors is rather difficult and costly. It usually takes days of machine down time and experienced operator to perform these measurements. Furthermore, high-end controllers, capable of 3D error compensation, are expensive and rare. For these reasons, 3D volumetric calibration has not been widely used.

Recently, Optodyne has developed a new revolutionary laser vector technique for the measurement of 3 D volumetric positioning errors, including 3 displacement errors, 6 straightness errors and 3 squareness errors. All these errors can be measured in a few hours instead of a few days by a conventional laser interferometer. Using this technique, the 3D volumetric positioning errors can be measured and the results can be used to compensate the 3D volumetric positioning errors through the G-code.

Also, compensate the part program or G-code makes it unnecessary the need of a high-end controller. Hence, a low cost CNC machine can perform as a high cost machine, provide the machine is repeatable. Furthermore, calibrating only part volume allows the collection of more compensation points in a smaller volume, resulting in higher accuracy and less measurement time. This new technique of compensation through G-code has been demonstrated using various machines and the improvement in accuracy is significant.

Optodyne, a California corporation, develops, manufactures and markets laser-based precision measurement equipment for machine tool calibration, metrology, OEM, and other industrial applications that require precision measurement through a worldwide distribution network. The basis of the company's products is the patented Laser Doppler Displacement Meter (LDDM) technology developed by Dr. Charles Wang, Ph.D. Optodyne is ISO/IEC 17025 accredited, which requires a quality system similar to ISO 9000, plus testing and calibration equipment, as well as knowledgeable testing and calibration personnel.