



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

KES MACHINE LLC
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CALIBRATION

Valid To: December 31, 2018

Certificate Number: 4163.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Dimensional

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Linear Accuracy ³ – Machine Tools, CNC, ID/OD gages, CMM	Up to 80 m	(1.9·3L) μm	Laser interferometer
Angle ³ – Machine Tools, CNC, CMM	± 10 degrees	(0.02 %A ± 0.5 ± 0.1M) μrad	Laser interferometer
Straightness ³ – Machine Tools, CNC, CMM	(0.1 to 4.0) m (1 to 30) m	(0.005A ± 0.5 ± 0.15M ²) μm (0.025A ± 5 ± 0.015M ²) μm	Laser interferometer
Straightness and Squareness ³ – Machine Tools, CNC, CMM	Up to 30.5 m	Plane flatness: 2.5 μm + 2.5 μm/m Top/left beam/plane: 5 μm/m Top/back beam/plane: 5 μm/m Left/back beam/plane: 15 μm/m	Hamar alignment system
	Up to 24 in	(58 + 4L) μin	Master square and an indicator

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Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
Rotation accuracy ³ – Machine Tools, CNC,, Rotary Tables, CMM	360 degrees	5 µm/m	Renishaw XR20 calibrator
Rotation accuracy ³ – Machine Tools, CNC, CMM	± 300 degrees	5 µm/m	API swivel check
Volumetric Performance ³ – Machine Tools, CNC, CMM	Up to 80 m	3(1.9-3L) µm/m	Laser interferometer
Circular interpolation ³ – Machine Tools, CNC, CMM	(50 to 600) mm	(0.7 + 0.3 %L) µm	Renishaw QC20-W ball bar

¹ This laboratory offers commercial dimensional testing, calibration service, and field calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMC's represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ In the statement of CMC, L is the numerical value of the nominal length of the device measured in meters, A is the displayed flatness reading, and M is the nominal length of the diagonal measured in meters.





Accredited Laboratory

A2LA has accredited

KES MACHINE LLC

Newington, CT

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets R205 – *Specific Requirements: Calibration Laboratory Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 3rd day of October 2016.



A handwritten signature in blue ink, reading "Jim C. Bunt".

Senior Director of Quality and Communications
For the Accreditation Council
Certificate Number 4163.01
Valid to December 31, 2018

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.