SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

KES MACHINE LLC
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CALIBRATION

Valid To: December 31, 2024 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 calibrations[1, 6]:

I. Dimensional

| Parameter/Equipment | Range | CMC[2, 4] (±) | Comments |
|---|---|---|---|
| Linear Accuracy[3] – Machine Tools, CNC, ID/OD Gages, CMM | Up to 80 m | (0.5$M$) µm | Laser interferometer |
| Angle[3] – Machine Tools, CNC, CMM | ± 10° | (0.002$A$ + 0.5 + 0.1$M$) µrad | Laser interferometer |
| Straightness[3] – Machine Tools, CNC, CMM | (0.1 to 4.0) m<br>(1 to 30) m | (0.005$A$ + 0.5 + 0.15$M^2$) µm<br>(0.025$A$ + 5 + 0.015$M^2$) µm | Laser interferometer |
| Rotation Accuracy[3] – Mills, Lathes, Machining Centers, Rotary Tables, CMM | 360° | 5.8 µrad | Rotary calibrator |
| Volumetric Performance[3] – Machine Tools, CNC, CMM | Unlimited[5] | Linear: (0.5$M$) µm<br>Angular: (0.004$A$ + 0.5 + 0.11$M$)) µrad<br>Straightness: (0.01$A$ + 1.5) µm<br>Roll: (0.01$A$ + 6.3 µrad) µm | Laser interferometer |

| Parameter/Equipment | Range | CMC[2, 4] (±) | Comments |
|---|---|---|---|
| Volumetric Performance[3] – Machine Tools, CNC, CMM | (50 to 600) mm | (0.7 + 0.003*M*) µm | Ball bar calibrator |
| Circular Interpolation[3] – Machine Tools, CNC, CMM | (50 to 600) mm | (0.7 + 0.003*M*) µm | Ball bar calibrator |

[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. CMCs 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. 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 actual 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, *A* is the displayed flatness reading in µrad, and *M* is the nominal length of the diagonal measured in meters.

[5] Unlimited measurement range is possible with software stitching.

[6] This scope meets A2LA's *P112 Flexible Scope Policy*.

# 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 17025:2017 *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 April 2017*).

Presented this 14th day of November 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4163.01
Valid to December 31, 2024

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