

Auttapoom Lounghongkam, Lt. 2011: A Study an Application of Michelson Laser Interferometer for Calibration Block Gauges. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Chana Raksiri, D.Eng. 111 pages.

This research proposes an application of Michelson laser interferometer for calibration block gauges. Michelson laser interferometer is the high precision length measurement in the resolution of one nanometer. The optical setup is described and the theory is derived. The measurement system composes of laser interferometer, an application machine and gauge blocks. There are 2 experiments in this research for calibration the machine and calibration grade 2 gauge blocks, the nominal length are 70 mm, 80 mm, 90 mm, and 100 mm. The uncertainty of this system is determined from the laser interferometer by direction measurement method, an application tool and environment. The experimental results refer to International Organization for Standardization, ISO.

Experimental results show that the length of grade 2 gauge blocks are 70.00048 mm, 79.99950 mm, 90.00396 mm and 100.00279 mm and measurement uncertainty of all experiments are  $\pm 0.692 \mu\text{m}$ ,  $\pm 0.774 \mu\text{m}$ ,  $\pm 1.325 \mu\text{m}$ , and  $\pm 0.968 \mu\text{m}$ . Refer to the standard measurement, the  $E_n$  Ratio are 0.172, 0.295, 2.51 and 2.343. So, the experiment results show the proposed approach can be applied for calibration grade 2 gauge blocks in length 70 mm and 80 mm.

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