MAPAN
Journal of Metrology Society of India

DOI 10.1007/s12647-015-0157-x

Springer

Original Paper

Validation of Software Used for Calibration of Angle Block at CSIR-NPL, India

M. Arif Sanjid and K. P. Chaudhary

Standards of Dimension Division, CSIR- National Physical Laboratory, Dr K S Krishnan Marg, New Delhi 110012, India

M. Arif Sanjid
Email: sanjid@nplindia.org

Received: 10 June 2015 / **Accepted:** 21 October 2015 / **Published online:** 30 November 2015

Abstract

In the field of dimensional metrology, angle blocks are calibrated using a precision indexed rotary table in conjunction with an autocollimator. Only few national metrology institutes (NMI) of developed counties has sophisticated automatic setup of indexed table, autocollimator. NMIs use individual analytical model for angle block calibration. Based on the analytical model, NMIs has exclusively written software to generate calibration results. Some NMIs of developing economics manually operate indexed rotary table, autocollimator for angle calibration. The readings of indexed table, autocollimator are recorded manually. The results are calculated manually or on excel sheets. Frequently, operator commits mistakes in determining the sign of angular deviation. At National Physical Laboratory-India, a generic analytical mathematical model is devised for angle block calibration. Software entitled ‘‘Calibration of angle gauge’’ is developed. The software takes readings of indexed table, autocollimator to calculate the angular deviation of angle block. Instead of direct coding the generic analytical mathematic model, the software is written with logical basis of the generic analytical mathematic model. A set of measurement readings of angle blocks are used as reference data to validate the software and analytical model.

Keywords

Angle blocks; Software; Validation; ISO 17025; Calibration