

SUMMARY

KETIDAKPASTIAN ALAT UKUR KERATAAN PERMUKAAN

THE UNCERTAINTY
OF SURFACE EVENNESS MEASURING DEVICE

Created by RIDWAN, USTADI

Subject : Alat pengukur

Keyword : alat ukur; kerataan permukaan; ketidakpastian; kesalahan

Description :

Alat ukur kerataan permukaan yang telah dibuat oleh saudara Ziyad Auliy dan Rio Borneo P. di Laboratorium Metrologi Industri Dan Kalibrasi Dimensi Jurusan Teknik Mesin FTI ITS dengan memanfaatkan sensor LVDT terdiri dari tiga bagian utama yaitu unit pengkondisian sinyal, unit pengolah data, dan unit penggerak mekanik. Menurut ISO 9000 menyatakan bahwa setiap alat ukur harus diketahui nilai ketidakpastiannya, untuk itu pada tugas akhir ini akan dianalisa ketidakpastian dari alat ukur kerataan tersebut.

Analisa ketidakpastian dari alat ukur kerataan permukaan meliputi analisa faktor-faktor penyebab kesalahan alat ukur kerataan permukaan, memodelkan faktor-faktor penyebab kesalahan dengan model matematika, membuat persamaan ketidakpastian dan menghitung nilai ketidakpastian alat ukur kerataan permukaan tersebut.

Dari penelitian yang telah dilakukan dapat diketahui faktor-faktor penyebab ketidakpastian pada alat ukur kerataan permukaan yaitu kesalahan pembacaan alat ukur, posisi sensor LVDT tidak tegak lurus terhadap permukaan benda ukur, perbedaan temperatur alat ukur dan benda ukur standar, perbedaan koefisien ekspansi panas material penyusun alat ukur dan benda ukur, serta ketidakpastian benda ukur standar yang digunakan dalam pengukuran. Model persamaan kesalahan alat ukur kerataan adalah $E L L L (T T) T L s s s s = - + daD + a dD + .$ Dan nilai ketidakpastian alat ukur kerataan permukaan adalah $7,22 \hat{I} \frac{1}{4} m.$

Description Alt:

Measuring device of evenness surface that had been made by Ziyad Auliy and Rio Borneo in Calibration Dimension and Metrology Industry Laboratory at Mechanical Engineering Department of ITS Surabaya, operated based on LVDT sensor in which consist of three major unit namely conditioning signal units, data processing units, and mechanical activator units. Based on ISO 9000 standard conducted that each of measuring devices has to know the value of it uncertainty, so that in this final project would be analyzed the value of it uncertainty. The uncertainty analysis method from the device involves caused error factors of devices, modeling by using mathematical models, arranging the equation and counting the value from

uncertainty measuring of device.

Based on experiment in laboratory, we know that caused errors toward device consist of incorrect perusal of devices, no perpendicular position of device toward work piece surface, the different of temperature between device and work piece, the different of expansion heat coefficient between materials device and work piece and also lack of dimension standard of work piece in measurement process. The equation model of error in measuring at evenness surface is

$E = \sqrt{\Delta L^2 + \Delta T^2 + \Delta \alpha^2 + \Delta D^2}$ and the value from uncertainty of measuring device of evenness surface is $7,22 \times 10^{-3} m$.

- Contributor** : Dr. Ing. I Made Londen Batan, MEng
- Date Create** : 05/12/2008
- Type** : Text
- Format** : pdf.
- Language** : Indonesian
- Identifier** : ITS-Undergraduate-3100008031873
- Collection** : 3100008031873
- Call Number** : RSM 681.25 Rid k
- Source** : Undegraduate Theses of MEchanical Engineering, RSM 681.25 Rid k, 2008
- COverage** : ITS Community Only
- Right** : Copyright @2008 by ITS Library. This publication is protected by copyright and permission should be obtained from the ITS Library prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. For information regarding permission(s), write to ITS Library

Full file - Member Only

If You want to view FullText...Please Register as MEMBER

Contact Person :

Mr. Edy Suprayitno (edy_supra@its.ac.id)

Mrs. Ansi M. Putri(ansi@its.ac.id)

Mr. Taufik Rachmanu (taujack@its.ac.id)

Mrs. Dewi Eka Agustina (dee@its.ac.id)

Thank You,

Nur Hasan

ITS Digilib Supervisor