

**EVALUATION OF DIFFERENT SENSOR SYSTEMS FOR THICKNESS
MEASUREMENT**

By

Muhammad Hanif
11301049

BACHELOR'S DEGREE
in

Mechanical Engineering – Mechatronic Concentration
Faculty of Engineering and Information Technology

SWISS GERMAN UNIVERSITY


SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat Kav No. 15, Alam Sutera
Kota Tangerang, Banten 15143 - Indonesia

August 2017

Revision after The Thesis Defense on 26/07/2017

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



Muhammad Hanif

Student

Date

Approved by:

Prof. Dr.-Ing. Werner Krybus

Thesis Advisor

Date

Ir. Arko, Ph.D

Thesis Co-Advisor

Date

Dr. Ir. Gembong Baskoro, M.Sc.

Dean

Date

Muhammad Hanif

ABSTRACT

Evaluation of Different Sensor Systems for Thickness Measurement

By

Muhammad Hanif
Prof. Dr.-Ing. Werner Krybus, Advisor
Ir. Arko, Ph.D., Co-Advisor

SWISS GERMAN UNIVERSITY

Thickness measurement has been applied in many industrial applications for quality control and in-service verification. Capacitive thickness measurement is one of commonly used methods for evaluating product such as thin film, as available in the laboratory exercise for Bachelor Course “Messwerterfassung und Umformung” at FH Soest, Germany. With more industrial products whose thickness need to be accurately determined, more thickness sensor systems need to be added into the laboratory exercise. This thesis work is focused on selecting and evaluating the suitability, accuracy and precision of two other sensor systems, namely laser triangulation sensor and eddy current sensor. The laser triangulation sensor is used to determine the thickness of aluminum plates of around 2mm, whereas the eddy current sensor is used to determine the thickness of thin films of around 84 μ m. The overall system will consist of PC with LabView, DAQ NI-6008 USB, sensor systems, and different types of objects whose thickness needs to be determined accurately. The NI – 6008 USB will be used as the data acquisition system which will be connected to a PC where LabView is used for recording and analyzing the sensor values. The measurement of the laser sensor revealed that the aluminum plate is exactly 2.00 mm. The measurement of the eddy current sensor revealed that the thin film to be 84.70 μ m with a \pm 0.99 μ m deviation. The most accurate sensor is the laser sensor with sensitivity of 0.8mV/ μ m, follow by the capacitor sensor of 1mV/ μ m, and lastly is the eddy current sensor of 4.3mV/ μ m.

Keywords: Thickness Measurement, LabView, Resolution, Linearity, Sensitivity



DEDICATION

I dedicate this work for myself, my parents, and friends.



ACKNOWLEDGEMENTS

The completion of this thesis is not possible without the support of my family and colleagues. I would like to say I consider myself lucky as I got this far, however without the blessing from Allah SWT I would be nothing.

I would like to thank my advisor Pro. Dr. –Ing. Werner Krybus for his guidance, patience, support, and the opportunity for the chance to do my thesis at Fachhochschule Südwestfalen Soest, Germany. I would like to thank my co-advisor Ir. Arko, Ph.D for his guidance, patience, and support from the beginning until the end of thesis. I would like to personally thank Mr. Sascha Schmidt, Mr. Andre, and the other people at Laboratory of Image Processing Soest for their support and patience.

In addition, I would like to thank Nabila Gina Nastiti for her advice and patience. Equally, I would like to thank Kristophorus Peter, Paksi Mega Bumi, Albert Wirawardhana, Fabriallian Handoko, Andrina Herawati, Edwin Sebastian, and Brian Wijaya. Lastly, I would like to thank all of my close friend for the unconditional non-binding contract friendship from the beginning of my university year at Swiss German University.

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