MODELING AND DESIGN OPTIMIZATION OF FOLDING TABLE FRAME USING SOLIDWORKS SOFTWARE

By

EDUARDO ARDITA
2-1752-034

MASTER'S DEGREE
in

MECHANICAL ENGINEERING - MANUFACTURING CONCENTRATION
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

SGU®

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

August, 2018

Revision after the Thesis Defense on 31 July 2018

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.

Eduardo Ardita

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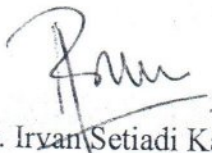
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ABSTRACT

MODELING AND DESIGN OPTIMIZATION OF FOLDING TABLE FRAME USING SOLIDWORKS SOFTWARE

By

Eduardo Ardita
Dena Hendriana, B.Sc., S.M., Sc.D., Advisor
Dr. Ary Syahriar, M.Sc., Co-Advisor

SWISS GERMAN UNIVERSITY

To supply the needs of residential house at affordable prices, many residential house are built with a small type. Having a house with a small type will cause new problems in the arrangement of furniture needed, it is necessary to have a furniture engineering that aims to have a furniture can have more than one function or can be folded.

Aspects of someone's experiences are affect in engineering furniture, but these aspects are subjective and different from one and another, depending on the length of time they are in their work, and depending on the complexity of the problems they have solved. Therefore in the implementation need to be supported with aspects of technology and science in order to produce safety standards on furniture has made.

This research attempts to present a concise, simple and comprehensive simulation using SolidWork software. This software can help us to see a possible outcome of a design we have planned through visual simulation, so failure in design creation can be anticipated early. A simulation process is able to reduce lost time, and reduce costs, if we compare it by looking for a result through a direct implementation of the design we have created.

The end result of this research is that when a design is implemented and tested, the prototype is able to achieve all the goals of the design requirements.

DEDICATION

This thesis is dedicated to the development of the world of engineering,
especially to support the creation of innovations in the field of furniture engineering
in Indonesia which takes into account the safety factor.

ACKNOWLEDGEMENTS

First, I thank God for the health gifts that are always given to me.

To my Parents, Ndari, Filio, Kenjiro and Michelle for your love, support and patience, so I can reach my dream.

I would also like to express my sincere thanks to my thesis adviser, Mr. Dena Hendriana, B.Sc., S.M., Sc.D., Mr. Dr. Ary Syahriar, M.Sc., and all the lecturers of SGU, for their guidance and support throughout my study.

Thanks to my brothers, Ernanto and Ansgarius for your great help.

To all my friends, thank you for your supports when I was drop.

Hopefully this thesis will be the beginning in my life journey.

DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE BY ANALYZE THE AIR FLOW USING COMPUTATIONAL FLUID DYNAMIC TO PRODUCE DIFFERENT SOUND CHARACTER

By

Bagas Anjar Sadewa
2-1752-029

MASTER'S DEGREE
in

MECHANICAL ENGINEERING – MANUFACTURING CONCENTRATION
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DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE
BY ANALYZE THE AIR FLOW USING COMPUTATIONAL FLUID DYNAMIC
TO PRODUCE DIFFERENT SOUND CHARACTER

Page 2 of 85

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DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE
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ABSTRACT

DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE BY ANALYZE THE AIR FLOW USING COMPUTATIONAL FLUID DYNAMIC TO PRODUCE DIFFERENT SOUND CHARACTER

By

Bagas Anjar Sadewa
Dr. Ir. Hanny J. Berchmans, M.Sc. , Advisor
Dr. Ary Syahriar, DIC , Co-Advisor

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Saxophone mouthpiece is the most important part in producing the sound character on a saxophone music instrument. In this research, the focus point is on the interior design of saxophone mouthpiece. The factors that most affect the characteristics of the mouthpiece sound is not on the material of the saxophone mouthpiece, but on the design of baffles and chamber affect the airflow in the mouthpiece. Methods of Research and Development applied this research. This study uses Experimental Design based on R&D method. Using Computational Fluid Dynamics (CFD) in Solidworks additional software, the Flow Simulation. The development in this research is make an experiment by simulating and analyze the air flow velocity, turbulence intensity and accoustical power inside the saxophone mouthpiece, and measure the frequency and loudness level of sound produced by saxophone mouthpiece. With simulation result, the saxophone mouthpiece with ebonit material have faster air flow velocity (23,54 m/s) than mouthpiece with metal material (19,24 m/s), but metal material have maximum louder sound level (108.5 dB) than ebonit material (107.6 dB). But in experimental test, there are just small differences in the acoustic power. Which the metal material have 89 dB in maximum value, and ebonit material have 88 dB in maximum value.

Keywords: saxophone mouthpiece, computational fluid dynamic, flow simulation, flow analysis, mouthpiece baffle, saxophone accoustical element

DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE
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Page 5 of 85

DEDICATION

I dedicate this works for:

GOD Almighty, Allah Subhanahu Wa Ta'ala

The Future of The Country I loved, Republic of Indonesia

My Father and Mother, Alm. Tofik Priyatno and Suparni

My Lovely Wife, Diah Wahyuningsih

My Campus, ATMI Cikarang and Swiss German University

All of my Friends that joined as member of cooperation program ATMI – SGU

All of Saxophonist Musicians in Indonesia

DESIGN AND IMPLEMENTATION OF SAXOPHONE MOUTHPIECE
BY ANALYZE THE AIR FLOW USING COMPUTATIONAL FLUID DYNAMIC
TO PRODUCE DIFFERENT SOUND CHARACTER

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ACKNOWLEDGEMENTS

ENERGY CONSUMPTION ANALYSIS TO DETECT PROCESS FAILURE IN RUBBER COMPOUND MIXING PROCESS

By

Agus Triyanto
2-1752-002

MASTER'S DEGREE
in

MECHANICAL ENGINEERING – MECHATRONICS CONCENTRATION
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ENERGY CONSUMPTION ANALYSIS TO DETECT PROCESS FAILURE
IN RUBBER COMPOUND MIXING PROCESS

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Agus Triyanto

02 - 08 - 18

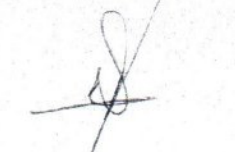Student   Date
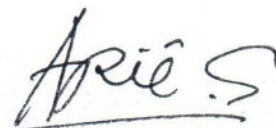
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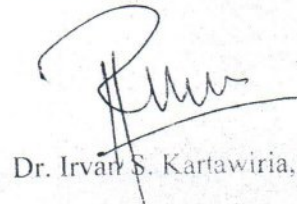Dr. Widi Setiawan   06 - 08 - 18

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ABSTRACT

ENERGY CONSUMPTION ANALYSIS TO DETECT PROCESS FAILURE
IN RUBBER COMPOUND MIXING PROCESS

By

Agus Triyanto
Dr. Widi Setiawan, Advisor
Dr. Ary Syahriar, Co-Advisor

SWISS GERMAN UNIVERSITY

Since there is no initial indicator system to detect abnormality in rubber mixing process, the problem can only be detected after the result of rubber production tested by laboratory teams. Abnormality will be late to be anticipated because the result of the test will be appeared after 8 to 10 batch afterwards. The abnormality in mixing process will be detected if the results of testing compound i.e. mooney viscosity, mooney scorch time, and tensile strength are out of the specification. The energy consumption will be measured for every batch by using internal current sensor in AC motor main drive. By reading the figure of measurement, energy consumption character will be identified and the specification standard of energy consumption can be defined. The result of energy consumption analysis is provided.

Keywords: *energy consumption, initial indication, abnormality, main drive.*

DEDICATION

By saying thanks to God, I dedicate this little work to:

1. Both beloved parents, Mr. Ripto Sugianto and Mrs. Iswati (alm).
2. My beloved wife and children, Ade Hepi Septiani, Ghania Farah Saliha and Khalid Maula Shiddiq.
3. Education and industrial world in Indonesia.

Thank you so much for everything, hopefully this paper can be useful for the advancement of science in the future.

Aamiin.

ACKNOWLEDGEMENTS

ANALYSIS AND COMPARISON OF 3D LASER AND SCANNING TECHNOLOGY TO MEASURE THE ACCURACY OF ACTUAL PRODUCTS TO DESIGN

By

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02-1752-011

MASTER'S DEGREE
in

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FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

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ABSTRACT

ANALIZED AND COMPARISON OF A LASER 3D SCANNING AND CONTACT 3D SCANNING TECHNOLOGY WITH 3-DIMENSIONAL DESIGN IN MEASURING 3-DIMENSIONAL PRODUCT

By

Ardi Nugroho
Dena Hendriana, B.Sc, S.M, Sc.D, Advisor
Ary Syahriar, B.Sc, M.Sc, DIC, Co-Advisor

SWISS GERMAN UNIVERISTY

In the mold and dies manufacturing industry, measurements of 3D contours are difficult to measure using conventional measuring instruments. Currently many are using CMM (Coordinate Measuring Machine). However, measurement using CMM is relatively time consuming and less flexible because it must bring the workpiece to CMM.

In this research will be shown another 3 dimensional measurement technique that is using laser scanner. This laser measurement technique is expected to measure the 3D profile accurately.

The results of data scanning from this laser scanner can be reconstructed into three-dimensional images. This allows us to compare directly with the design of the workpiece, so that it can be directly visible visually the result of the dimensions of the workpiece compared to the product design.

Three-dimensional measurements using lasers are also faster and more efficient than using CMM.

Keywords: 3D scanning, laser scanning, reconstruction, 3D image, measurement

DEDICATION

I dedicate this works for my family, ATMI Cikarang and Indonesia

ACKNOWLEDGEMENTS