

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

By

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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.

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ABSTRACT

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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



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



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The author realized that the completion of this thesis is still far from perfect. Therefore, the authors expect suggestions and constructive criticism from readers. And finally, the author expect this thesis can be useful for readers and also the wider community.

Tangerang, June 6th 2018

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