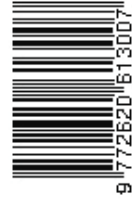


PROCEEDING

**INTERNATIONAL CONFERENCE
ON EDUCATION IN MUSLIM SOCIETY**



The Faculty of Educational Sciences UIN Syarif Hidayatullah Jakarta,
in partnership with Universiti Putra Malaysia & University of South Australia
LP2M UIN Syarif Hidayatullah Jakarta, The Embassy of Canada in Indonesia,
and The Embassy of France in Indonesia



PROCEEDING

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**The 3rd
ICEMS 2017**
**INTERNATIONAL CONFERENCE
ON EDUCATION IN MUSLIM SOCIETY**

October 25th -26th, 2017

**“Education in the 21st Century:
Knowledge, Professionalism, and Values”**

Organized by: The Faculty of Educational Sciences UIN Syarif Hidayatullah Jakarta,
in partnership with Universiti Putra Malaysia & University of South Australia
Supported by: LP2M UIN Syarif Hidayatullah Jakarta, The Embassy of Canada in Indonesia,
and The Embassy of France in Indonesia



PROCEEDINGS

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WELCOME NOTE
RECTOR UIN SYARIF HIDAYATULLAH JAKARTA
Prof. Dr. Dede Rosyada, MA

Assalamu'alaikum Wr. Wb.

May peace and God's Mercy and blessings be upon you all

Distinguish speakers and participants,



Let us first express our gratitude to God the Almighty for all His blessings which have enabled us to attend the 3rd ICEMS (International Conference on Education in Muslim Society). It is a real pleasure to welcome you all to Syarif Hidayatullah State Islamic University (UIN Syarif Hidayatullah) Jakarta. This year, the conference raises the issue of "Education in the 21st Century: Knowledge, Professionalism, and Values" is the theme, which I think very relevant to be discussed these days.

I am also pleased to learn that in its 60th anniversary, the Faculty of Educational Sciences (Fakultas Ilmu Tarbiyah dan Keguruan), is able to hold such an important event, especially knowing that this event is also supported by a number of our partner institutions. I really appreciate the involvement of the Faculty of Education of the Universiti Putra Malaysia and Centre for Islamic Thought and Education the University of South Australia. I am also thankful to the Embassy of Canada and the Embassy of France. I hope the partnership will continue to flourish in years to come.

Since its transformation from the State Institute of Islamic Studies in 2002, the University continues to nurture various academic activities and expand its partnership to various institutions. In the last couple of years, we enhance our academic activities to involve international partners. We also encourage and facilitate our colleague professors and lecturers to increase their national and international publication. This is important not only to make this University more heard and seen, but more importantly to improve its contribution to knowledge and societies around the world. There are certainly so many things need to be done to make this University more productive and more contributive, but what we see today, is an example of how our academics give their best efforts to improve the University's achievement. I am absolutely thankful and pleased with this achievement.

I would also like to take the opportunity to thank distinguished speakers and participants from many different countries and institutions. Without your participation, this conference will not be as successful as it is today. And please allow me to also to thank and congratulate The Faculty of Educational Sciences, especially the conference committee, that are able to gather scholars from different universities across countries and continents to come to this University, and create a big space to discuss a very important theme for our future generations.

I believe that all of you will take a lot of benefits from this conference, and I also believe that your contributions as speakers and participants will have an impact to the development of education in Muslim societies and societies of different faith and beliefs. I wish you to have an enjoyable and fruitful conference. Thank you.

Wassalamu'alaikum Wr. Wb.

WELCOME NOTE
DIRECTOR OF LP2M (PVC RESEARCH AND COMMUNITY ENGAGEMENT)
UIN SYARIF HIDAYATULLAH JAKARTA
Prof. Dr. Arskal Salim GP, MA

Assalamu'alaikum Wr. Wb.

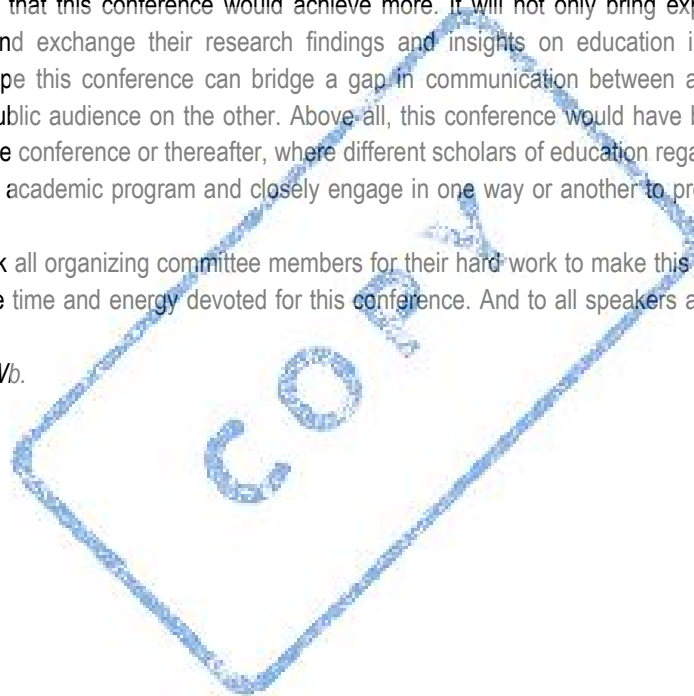


On behalf of the Institute for Research and Community Engagement (LP2M) UIN Syarif Hidayatullah Jakarta, let me convey my warmest welcome to keynote and invited speakers, presenters and all participants of the 3rd International Conference of Education in Muslim Society (ICEMS). LP2M is very delighted to know that the 3rd ICEMS has attracted many scholars and educators from different parts of the world to come to attend this great event in Jakarta this year. This conference is one of the many conferences that UIN Jakarta is organizing in 2017. UIN Jakarta provides support for 12 (twelve) conferences to take place this year. All this is intended not only to boost UIN's world wide networking but most importantly to encourage and promote UIN lecturers' intellectual exposure at the international level. I am so grateful that the Faculty of Tarbiya and Educational Sciences is taking a part to achieve such objectives.

I personally expect that this conference would achieve more. It will not only bring experts and scholars into a forum where they can share and exchange their research findings and insights on education in Muslim society from various perspectives, but I do hope this conference can bridge a gap in communication between academia on the one hand and practitioners as well as public audience on the other. Above all, this conference would have been more successful if it could provide a space, during the conference or thereafter, where different scholars of education regardless of their backgrounds and affiliations can initiate an academic program and closely engage in one way or another to produce knowledge in any kind of formats.

Finally, let me thank all organizing committee members for their hard work to make this conference taking place. I really appreciate your invaluable time and energy devoted for this conference. And to all speakers and paper presenters: thank you and enjoy the conference.

Wassalamu'alaikum Wr. Wb.



WELCOME MESSAGE

DEAN OF THE FACULTY OF EDUCATIONAL SCIENCES
UIN SYARIF HIDAYATULLAH JAKARTA
Prof. Dr. Ahmad Thib Raya, MA

Assalamu'alaikum Wr. Wb.

Dear Conference Speakers and Participants,



The Faculty of Educational Sciences of UIN Syarif Hidayatullah Jakarta is pleased to welcome you to the third International Conference on Education in Muslim Society (ICEMS). The conference aims to get together experts and practitioners of education from various countries to share knowledge and experiences based on their research and insightful experiences.

This year's conference is very special because the Faculty as well as the University is celebrating its 60th anniversary. While it cannot be considered old for an institution, 60 years of existence gives a lot of experiences in managing teacher education. We continue to learn from experts and teachers, especially realizing that the 21st century is bringing a lot of challenges to teacher education. This is one of the reasons why this conference takes place.

We would like to thank our colleagues from Universiti of Putra Malaysia and the University of South Australia who have extended their collaborative endeavor to support this conference. We are looking forward to continue our partnership in managing the conference in the future as well as other initiatives.

We are also very grateful to receive support from the Embassy of Canada and the Embassy of France in Indonesia. The presence of experts from both countries enriches this year's conference, and we believe that the delegates find very much knowledge and experience to learn and enjoy as much as we do.

We feel honored and blessed to welcome participants who come from different institutions and different countries. We hope you to enjoy this conference and your visit to this University.

We are thanking Allah the Almighty for this opportunity and we ask His blessings to make this conference a successful one. Thank you

Wassalamu'alaikum Wr. Wb.



WELCOME REMARKS
CHAIR OF THE 3rd ICEMS
(INTERNATIONAL CONFERENCE ON EDUCATION IN MUSLIM SOCIETY)
UIN SYARIF HIDAYATULLAH JAKARTA
Maila Dinia Husni Rahiem, Ph.D.

Assalamu'alaikum Wr. Wb.

Welcome to all the speakers, presenters, and participants of the 3rd International Conference on Education in Muslim Society (ICEMS).



We have invited sixteen prominent scholars; six from Indonesia, four from Australia, two from Malaysia, one from Canada, one from the UK, one from France, and one from the US to lead us through an exploration of the conference theme: "Education in the 21st Century: Knowledge, Professionalism and Values."

Their abstracts are printed in the conference program books. We hope that you have had an opportunity to read them before their presentations, and so we look forward to a number of lively and interesting discussions that will be the focus of this year's conference.

We also invited you, as conference participants, to write papers related to the theme. Subsequently, we received an amazing set of presentation proposals from all over the Asia Pacific and beyond—Indonesia, Australia, Malaysia, Vietnam, Qatar, Nigeria, Jordan, Iran, the UK, Canada, and the US.

From these efforts, we hope to produce a related set of papers for international publication by Atlantis Press, which are proposed to be indexed in Thompson Reuters; publication in journals, such as in *Tarbiya-Journal of Education in Muslim Society*, *Arabiyat-Arabic Language and Literature Journal*, *Sosio Didaktika-Social Sciences Education Journal*, *Edusains—Science Education Journal*, *Dialektika—Indonesian Language and Literature Journal*, *IJEE-Indonesian Journal of English Education*; as well as in national indexed conference proceedings.

This conference that is hosted by the Faculty of Educational Sciences—UIN Syarif Hidayatullah in partnership with the Faculty of Educational Studies—Universiti Putra Malaysia and Centre for Islamic Thought and Education—University of South Australia, is the beginning of so many opportunities to collaborate and work together with scholars concerning issues of education in Muslim Society. We look forward to engaging with all of you to produce a comprehensive and thoughtful set of work that can guide our endeavors in the years to come.

Thank you for all the committee and student volunteers that have worked very hard and passionately to help prepare this conference over the past year.

Wassalamu'alaikum Wr. Wb.

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THE ANALYSIS NOISE LEVEL REDUCTION FOR PORTABLE GENERATOR USING ENCLOSURE ACOUSTIC

Zulkarnain, Solicha, Wawan Darwan, Indah Novianty

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Abstract. This research aims to design an acoustic enclosure combined with coconut fiber to reduce the level of external noise generated by the portable generator. The study conducted with measuring the noise level in the generator before and after installing acoustic enclosure. The experiment has done with measuring the noise level of the generator before and after pairing the enclosure. Measurement of noise level has done according to ISO standard. Measurements are made five times in each point, the data shown is the average value of the measurement results. Then noise level data is displayed in table form and noise contour. Enclosure made using steel plates with a thickness of 3 mm and coconut coir fiber sheet of thickness of 35 mm. The results show that noise levels after installing with enclosure acoustic less than 70 dB. The noise level of the portable generator was 91.20 dB before covering with acoustic enclosure. Experimental results show that the use of enclosures combined with coconut fiber can lower the noise level of the portable generator. The use of coconut fiber in the acoustic enclosure is expected to replace the use of industrial acoustic materials. So, the public can make a cheaper acoustic enclosure.

Introduction

Noise is sound sources that disturbing sense of human hearing. The noise level is a measure of how high and low degree of noise expressed in decibels (dB). The high-level noise sources can cause an impact on environmental, people mental health and physical. Noise source with 8 hours/day exposure and pressure intensity level 85 dB can cause people an impact in the health conditions. Therefore, it is necessary to control the level of noise that generated by the portable generator. There were several methods to control the level noise. Controlling the level of noise can be doing at the source of a noise. It is something a primary concern to reduce noise at its source. Whenever possible, technologies should be used. Secondly, the controlling noise can be held at transmission path. This method can be carried out by designing an acoustic barrier, wall insulation as well as cutting off the vibration through the installation using vibration absorber. Third, the noise control carried out on the receiver. This method has a purpose to prevent the listener exposed the noise with high intensity and longer periods of time.

A portable generator is a small-scale electricity supply plant that is currently available at the market. It is widely used especially in the situation of the abrupt electric outage. This type of generator is also widely used by official/residential buildings. Especially people on the rural community have not been electrified from government's company. In their operation, generally, portable generators emit noises loudly. The components of the portable generator set such as the diesel engine, and engine exhaust, would arise as main noise sources in buildings and surrounding environment. In this paper, an acoustic enclosure for portable generator was designed to reduce the noise level below sound pressure level (SPL) of 80 dB from the high level exceeding 90 dB. Enclosure is designed using an absorbent material made from natural fibers. Natural fibers combined with steel plates and heat-resistant foam which sold in the market.

Noise Absorber Material

Indonesia is an agricultural country where the majority of people still rely on life in agriculture. Coconut fiber is one of the byproducts of agriculture. Most of the coconut fiber has used as a filler material mattress; the material has made as a breakwater and a rope. These coconut fibers can have used as acoustic materials. Several studies have been carried out for this purpose (Rozli, 2010 & 2011, Firmansyah, 2013, Zulkarnam, 2011). However, these studies were basic development research in the manufacture of acoustic material using coconut fibers. Many of the researchers conducted research on the acoustic properties of other natural fibers such as rice husks, palm fiber, tea leaves, and others (Rozli, 2010 & 2011, Firmansyah, 2013). These study results showed that this natural fiber has the absorption coefficient value good at high frequencies. To improve their noise absorption in the low frequency, usually natural fibers were combined with perforated plates or industrial absorbent material which is generally expensive (Asdrubali, 2007, Baranek, 1992).

This study aims to apply coconut fiber that has been known their acoustic characteristics from the earlier study. The decrease noise level on the portable generator is carried out by making the acoustic enclosure. Acoustic enclosure panel have made with a combination of steel plate, coir fiber, and foam heat insulation. Acoustic enclosure design expected to reduce noise by about 30 dB.

Acoustic Enclosure

The primary objective of any noise control project is to identify the main sources of noise on the portable generator. The key reduction in noise can achieve by reducing the noise

generated from the noise sources. The noise of vehicles and machines mainly generated by their motor generator which is usually an engine. One of the standing out contributor is the noise emitted by the engine surfaces. There are several methods to define the main noise radiating of the engine surfaces (Tandon, 1998).

One of the initial procedures in controlling noise is to determine the type barrier or panel (Cho, 2018). It aimed at reducing noise transmitted out optimally. In the design of acoustic panel, one should be able to calculate the value of transmission loss of a wall or barrier at a predetermined frequency range. Enclosure panels usually composed of two or more solid layers often used as partitions and other acoustic structures. The transmission loss for Region II, the mass-controlled region, may determine from the equation.

$$TL = 10 \log \left[1 + \frac{\pi f M_s}{\rho_0 c} \right] \quad (1)$$

Where M_s the specific mass for the layered panel is given by the following Equation.

$$M_s = \rho_1 h_1 + \rho_2 h_2 \quad (2)$$

The layers bonded at the interface with no air space, and then the composite panel bends about an overall neutral axis. The critical or wave coincidence frequency for the layered panel may be find from the following equation.

$$\chi = \frac{E_1 h_1^3 - E_2 h_2^3}{2(E_1 h_1 + E_2 h_2)} \quad (3)$$

$$f_c = \frac{c^2}{2\pi} \left(\frac{M_s}{B} \right)^{\frac{1}{2}} \quad (4)$$

The quantity c is the speed of sound in the air around the panel, and B is the flexural rigidity of the panel, given by the equation 5. The transmission loss for a layered panel may determined from equation 1 with the overall damping coefficient calculated from the following equation 6 (Barron, 2001).

$$B = \frac{E_1 h_1^3}{12(1-\sigma_1^2)} [1 + 3(1 - 2\chi/h_1)^2] + \frac{E_2 h_2^3}{12(1-\sigma_2^2)} [1 + 3(1 - 2\chi/h_2)^2] \quad (5)$$

$$\eta = \frac{(\eta_1 E_1 h_1 + \eta_2 E_2 h_2)(h_1 + h_2)^2}{E_1 h_1^3 [1 + 3(1 - 2\chi/h_1)^2] + E_2 h_2^3 [1 + 3(1 - 2\chi/h_2)^2]}$$

(6)

$$TL = TL_n(f_c) + 10 \log \eta + 33.22 \log(f/f_c) - 5.7$$

(7)

Acoustic enclosure is a structure that covers the source of noise usually machine that aims to protect the environment from exposure to noise. Based on size, the acoustic enclosure can divide into two kinds of small and large enclosure. Acoustic enclosure called a small if the dimension of the wavelength of bending and acoustical wavelength is greater than the largest size of the panel and enclosure volume. Acoustic resonance does not occur in the interior volume of the enclosure (Barron, 2001).

Inside the enclosure a reverberant sound field is produced in addition to the noise from the source. Reducing the acoustic resonances, the absorbing material can be used on the panel of the enclosure. Absorbing material has three advantages on enclosure panels. First, it can suppress the amplitude of the standing waves on enclosure. Second, it can increase the frequency of all standing waves resonances and lastly, it can widen the standing waves. The layer of sound absorbing material should be about half the thickness of the air space to damp out the resonance considerably. In the proposed enclosure the gap between engine surface and enclosure varied from 15 cm at various points (Munjaj, 2013). A uniform layer of coconut fiber sheet with thickness 35 mm applied to the inside panel of the enclosure. The absorption coefficient of coconut fiber varies from 0.28 to 0.85 in the frequency range of 63 Hz – 4000 Hz (Zulkarnain, 2011).

Measuring performance for all types of acoustic enclosure used insertion loss values. The operational definition of insertion loss illustrated in the following figure. Figure I demonstrates setup the measurement of insertion loss values that are outside the engine room based on the measurement of Sound Pressure Level (*SPL*) formulated as follows.

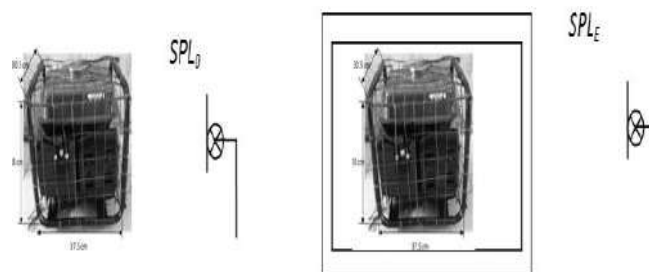


Figure I. Measurement setup to calculate the value of Insertion Loss

$$IL_P = SPL_0 - SPL_E \quad \text{dB} \quad (10)$$

SPL_0 where the average value of the measured sound pressure level around the location of the machine, SPL_E is the value of the pressure level engine covered acoustic enclosure. SPL value measurement can do at surrounding the sound source. Distance measurement must meet at least three times the size of the largest dimension of the enclosure. Analysis can also be performed using the following formula (Baranek, 1992).

Method

Portable generators used to produce electricity power of 700 watts. Measurement pressure level (SPL) conducted three times. To measure the noise level is done by measuring the generator has not been operated and after the generator be operated. Time consume for collecting data about 1 minute. The noise levels recorded to represents the difference between the noise level before and after the generator on operating. Designing acoustic enclosure has to be made based on the standard ISO 15667: 2000E.

Figure 2 illustrates the arrangement of the acoustic enclosure panel and the acoustic panel TL value is calculated using equation 1-7. The steel plates were for the outermost layer, and then combined with coconut fiber that it made into sheets and in the deepest part of the acoustic panel used the heat-retaining foam. Figure 2(a) describes the composition of the panel enclosure. The steel plate is used having a thickness of 3 mm and coconut fiber sheet having the thickness of 35 mm. The TL value of the acoustic panel can be seen in Figure 2(b), the value of TL is calculated by analytical equation.

Figure 3 (a) gives the dimensional dimension of the generator, while the enclosure size created is shown in Fig. 3 (b). Generator has length 37.5 cm, width 30.5 cm and height 28 cm. The acoustic enclosure size 80 cm x 60 cm x 60 cm. Noise level was measurement using Sound Level Meter SLM-814 and a calibrator. To deliver results accurately, generator and enclosure divided by into 5 sections, namely the measurement of the top, front, rear, left and right. For the illustration see figure 4(a) and 4(b). Figure 4 (a) is the measurement points before the generator is covered with the enclosure while the 4 (b) image is the measurement point of the generator covered with the enclosure.

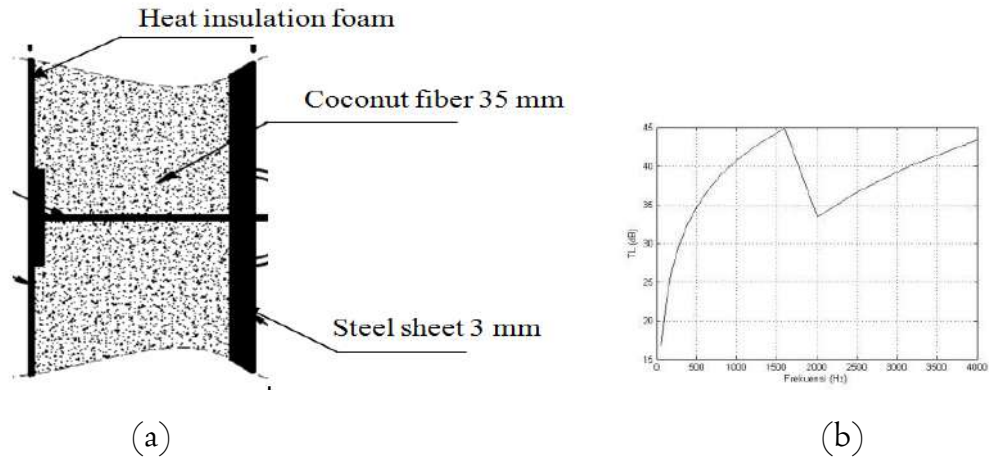


Figure 2. (a) composition of panel enclosure acoustic (b) TL for acoustic panel

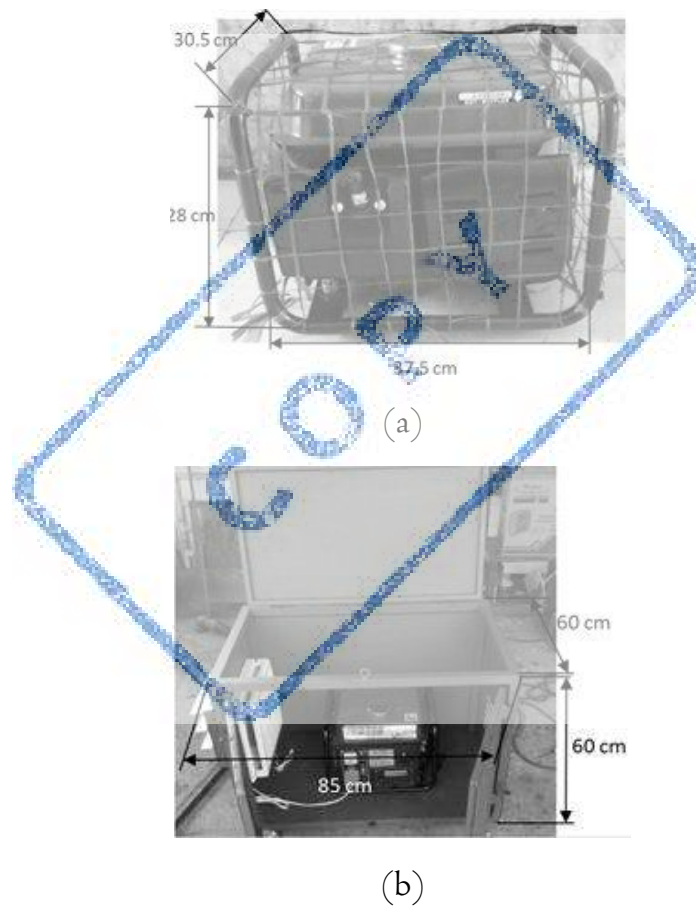


Figure 3. dimensions of (a) Portable generator (b) with enclosure

Results and Discussion

Measurement of noise levels on portable generator both before and after covering of the enclosure done at each measurement point. The data presented in Table 1 and 2 is the

average data of the noise levels. Table I is the value of the noise level at the rear of the generator which in this part is the most dominant noise contributor. Because in this section has the engine of the portable generator engine and the exhaust. In this section, the noise level is in the range of values between 93.3 dB – 97.7 dB. Furthermore, the level noise data at table I presented into noise level contour as can be seen in can be seen in Figure 5 (a) that the noise level contour image generator before mounted enclosure. Figure 5 (b) noise level contour that shows a decrease in the noise level after covering the enclosure.

Table I. The level noise portable generator without enclosure acoustic

NO	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9
Point 1	93.3	93.8	94.5	96.0	96.3	95.9	97.7	96.5	95.7
Point 2	95.7	95.1	96.3	96.8	96.3	96.6	95.8	96.4	96.1
Point 3	94.8	95.4	96.5	95.8	96.7	95.9	96.6	95.5	95.9
Point 4	93.6	92.2	94.3	93.7	94.5	95.5	95.9	95.8	95.1
Point 5	93.6	93.1	92.5	95.5	94.9	95.7	95.8	95.2	95.1

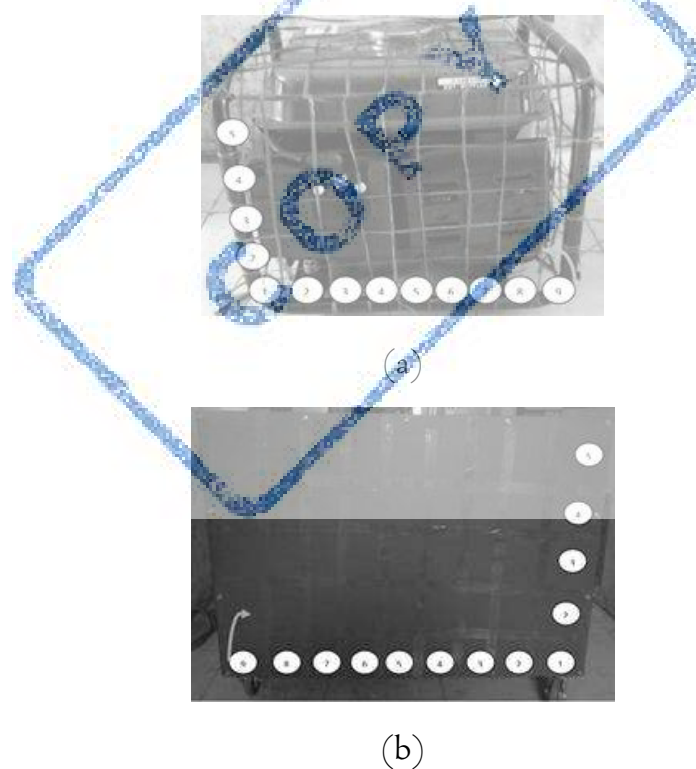


Figure 4. Noise level measurements point (a) portable generator (b) with enclosure

Table 2. The level noise portable generator with enclosure acoustic

NO	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9
Point 1	63.4	63.2	63.9	64.0	64.4	64.2	64.3	64.1	63.9
Point 2	63.2	62.8	63.0	63.2	63.8	64.3	63.1	63.2	63.2
Point 3	62.9	62.9	63.2	63.5	64.4	64.1	63.6	63.1	62.8
Point 4	63.0	63.2	62.7	62.8	62.9	63.1	63.8	62.2	62.3
Point 5	62.0	61.6	61.1	61.5	61.7	61.6	61.3	61.4	61.6

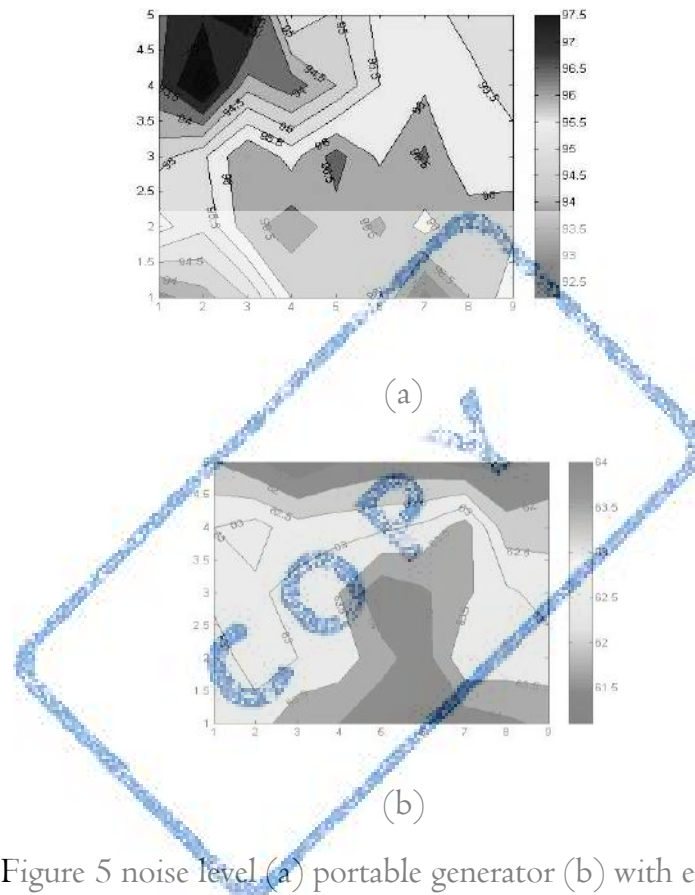


Figure 5 noise level (a) portable generator (b) with enclosure

The noise level of the portable generator on the rear side without enclosure exceed 93.3 dB, while the maximum value of 97.7 dB noise caused by the exhaust manifold of portable generators. The noise level of the portable generator on the rear side after covering with enclosure was approaching 62.20 dB. Figure 6 provides a comparison of noise level reduction that occurred generator has been fitting with enclosure. Calculations using equation 7-15 shows the error values are quite small. But on the left, an error value reduction of noise levels showed considerable value. This is occur because exist the passage of air duct at this point.

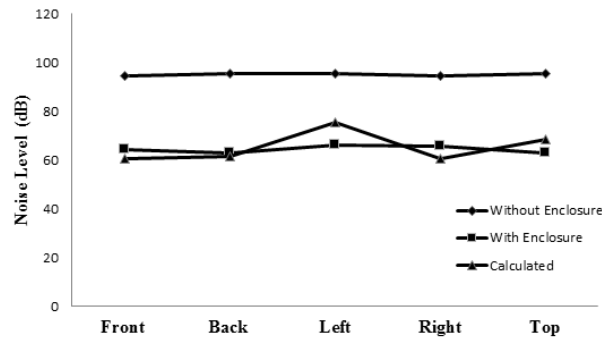


Figure 6. Noise level at the portable generator set with and without enclosure compare with simulation.

Conclusions

Using of coconut fiber as alternative materials to substitute industrial absorbent materials in the acoustic enclosure show significant results in a reduction of noise level of the portable generator set. Before covering with enclosure acoustic, the noise level on a portable generator can exceed average to 97.7 dB. After the portable generator in covers enclosure acoustics, the average value of the noise level that about to 62.20 dB. From the results of this test has been able to decrease the noise level of 35.50 dB. However, the uses of coconut fiber still provide a sizeable obstacle. The first coconut coir has flammable properties and can easily be damaged by climate. Therefore, for further research needs careful observation of the increasing temperature in the enclosure. It is also necessary to research to improve the resistance to fire of coconut husks and climate.

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