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Innovation of Blackening Labu Sayong

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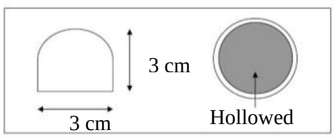

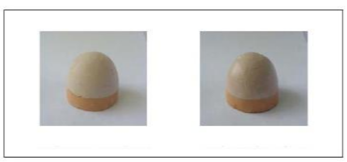

Sample-before burnished

Sample-after burnished

Abstract

The blackening technique of Labu Sayong (LS) or clay pitcher commonly performed either traditionally or in modern way is by removing the clay pitcher from the firing area one by one after the firing temperature reached maturity at around 850°C to 900°C. A finding indicates a few improvements can be done such as reducing the time of transferring the clay pitcher to the paddy husks, reducing the fuel consumption, uniforming the blackened effect of Labu Sayong and reducing the defects ratio of Labu Sayong. The innovative is to add paddy husks or organic materials into the kiln as soon as the firing temperature reached maturity during the cooling process. The paddy husks will get burnt and produce a thick smoke. By closing all the burner port holes and chimney damper, the smoke will diffuses inside the firing chamber which gave the blackened effect to Labu Sayong. Based on the studies, the best temperature to add the paddy husks into the kiln is between 350°C to 700°C, depending on the size of the kiln. The innovation blackening Labu Sayong can overcome the disadvantages of the conventional blackening technique while increasing productivity without additional operation costs.

Keywords: Labu sayong; blackening technique; paddy husks

Abstrak

Teknik penghitaman Labu Sayong (LS) yang biasa dilakukan, sama ada cara tradisional atau moden, adalah dengan mengeluarkan LS dari ruang pembakaran, satu persatu setelah pembakaran mencapai suhu matang, pada 850°C ke 900°C. Semasa proses mengeluarkan LS tersebut, didapati beberapa perkara yang boleh dipertingkatkan seperti mengurangkan jangka masa perpindahan labu ke sekam, mengurangkan penggunaan bahan api, menyeragamkan kehitaman LS serta mengurangkan nisbah kerosakan LS. Alternatif kepada kaedah penghitaman ini adalah dengan memasukkan sekam padi atau bahan organik ke dalam tanur semasa proses penyejukan sebaik sahaja pembakaran mencapai suhu matang. Sekam padi dimasukkan ke dalam tanur akan terbakar dan mengeluarkan asap yang tebal. Dengan menutup semua lubang penunu dan serombong, asap akan terperap di dalam ruang pembakaran, mengakibatkan LS menjadi hitam. Berdasarkan dari kajian, suhu yang terbaik semasa memasukkan sekam sekam padi ke dalam tanur bagi tujuan penghitaman ialah di antara 350°C ke 700°C, bergantung pada saiz ruang pembakaran. Inovasi teknik penghitaman Labu Sayong ini dapat mengatasi kelemahan di atas, di samping mempertingkatkan produktiviti, tanpa tambahan kos operasi.

Kata kunci: Labu sayong; teknik penghitaman; sekam padi

1.0 INTRODUCTION

The innovative blackening technique of Labu Sayong introduces methods and process which is different from the techniques practiced by the existing entrepreneurs. The conventional technique practiced by Labu Sayong entrepreneurs is by placing the hot clay pitcher inside the paddy husks or sawdust. The heat generated from the clay pitcher will burn the paddy husks thus producing a thick cloud of smokes. After some time, the process will give the blackened effect to the clay pitcher (Ahmad Fauzi, 1985).

From observation of the technique, a room for improvement is found to increase the efficiency of the blackening of Labu Sayong. Among the noted areas for improvement are the lengthy of time during transferring the clay pitcher to the paddy husks, excessive labors, the uneven blackened effect of clay pitcher, fuel wastage and unavoidable damage during the transferring process.

As such, a different technique to improve the blackening method of Labu Sayong has been taken into account. Among the methods being considered are to bring the distance of the pile of husks closer to the kiln, buried the husks in a crater-like hole on the ground and the use of a temperature measuring device (thermocouple & pyrometer). But the method considered to produce the blackened effect to the clay pitcher is by adding the paddy husks into the kiln without removing the clay pitcher from the kiln. The method saves labor, time, and fuel and reduces the damages of the clay pitchers.

Therefore the purpose of this research is to ensure the acquired blackened effect of clay pitcher is as good as the one produced through the conventional process. To achieve the objective, several experiments have been carried out to determine the best temperature to add the husks into the kiln.

To perform this experiment, a small scale kiln was built in order to simulate the firing by using small-scale samples as well. The samples used raw materials and production technique that was the same like Labu Sayong production.

■2.0 HISTORY OF THE EXISTENCE OF LABU SAYONG

Labu Sayong was an adaptation of a gourd. There are several theories about the origin of the creation of Labu Sayong. Based on information, there are three statements about the existence of Labu Sayong. According to a writer, Abdul Malik Abdul Ghani, Osman Sattar who is a native of Kg. Kepala Bendang had claimed that his ancestor (Tuk Kaluk) from Minangkabau was the original inventor of Labu Sayong. Tuk Kaluk migrated and settled in Sayong during the reign of Sultan Iskandar Zukarnain (1754M-1764M) (Abdul Malik, 1989:3). Meanwhile, according to Siti Zainon, the invention of clay pitcher by Tuk Kaluk began in 1810 during the reign of Sultan Abdul Malik Mansur Shah (1806-1825) (Siti Zainon, 1986:65).

As it turns out, the dates of the introduction of Labu Sayong in the state in both statements are different. However, what can be said is that the clay pitcher introduced in the district of Sayong was originated from Minangkabau, Indonesia. This statement can be trusted because the shapes of gourd like Labu Sayong has been widely used in Indonesia as a form of decoration as in the Great Mosque of Banten in Java, built around 1524M. The mosque used a rock in a form of water gourd to support the wooden pillars of the mosque structure (A. Halim, 1995:43).

Tuk Kaluk is believed to have a skill in metal art such as creating swords, machetes and dagger, and also in pottery making where he produced clay pitcher. Because of his skills, Tuk Kaluk became the 'royal' who had been entrusted to produce various forms of weapons and Labu Sayong for use in the castle. Apart from that, he was awarded several pieces of land by the Sultan and one of those was Kg. Kepala Bendang which Osman Sattar claimed was opened by Tuk Kaluk with his friend Seman Putih. His wife Fatimah was also skillful in pottery making and in the end they both managed to teach the residents of Kg. Kepala Bendang to make clay pitcher until it became a booming industry that helped the villagers increase their earnings (Abdul Malik, 1989:3).

Osman Sattar also claimed the clay pitcher produced by Tuk Kaluk was strong and of high quality because it does not absorbed water even though the water was stored in it for three months, and it does not shattered in pieces after it dropped but just split in two pieces. The water stored inside Labu Sayong is cool and fresh, and it is said that drinking the water from Labu Sayong can make a person looks youthful and healthy. Additionally, Labu Sayong water was used as an antidote to cure certain illness. Tuk Kaluk himself had stored antidote water in the clay pitcher to cure his illness (Abdul Malik, 1989:4).

However throughout the research, the name of Tuk Kaluk does not ring a bell to any of the generation of Labu Sayong maker in Kg. Kepala Bendang. None ever heard Tuk Kaluk as the pioneer of this craft. But most of them acknowledged the inherited skill from their ancestors, the natives of Kg. Kepala Bendang. According to Harun Majidin, 'Tuk Kaluk' is the word of Sayong people and during his childhood, it was used to show a certain era such as the ‘Tuk Kaluk era’. There is also other word with similar meanings as ‘Tuk Kaluk era’ that is 'Tuk Kadok era'.

Another informer, Jamilah Zani claimed that Labu Sayong was initially produced in Kg. Kuala Sayong as told by her mother Zeleha Pandak Sidek during a storytelling. One day, Jamilah’s ancestor dreamt about someone telling her that the best clay to produce clay pitcher is the clay from the river bank of Sayong River located near Kg. Kepala Bendang. Based on that dream, the ancestors moved to Kg. Kepala Bendang, and as true as the dream, the clay from the riverbank was much better for the production of Labu Sayong.

■3.0 TRADITIONAL WAY OF BLACKENING LABU SAYONG

Black Labu Sayong has become a signature of Sayong since the early 1900's as stated by Wray (1903) in his journal;

> “the hot jars are lifted out of the kiln and buried in a mass of padi husk, which quickly blackens them.” (pg. 28)

The statement pointed out that the hot Labu Sayong was removed from the firing pit and immediately buried inside the mass of paddy husks to blacken it. Furthermore, the black color of Labu Sayong was purposely created to differentiate it with clay pitcher from Pulau Tiga which was yellow in color. The blackening process was named as ‘sekam’ (husk) because the main material used is paddy husks.

Before the blackening process, the clay pitcher body had gone through a number of processes in advance such as forming, burnishing, decorating, drying and open firing. The blackening process is carried out after the open firing. The fired clay pitcher is removed from the firing pit by using a stick that was inserted to the clay pitcher mouth. It was then lifted and immediately buried inside the husks. The heat from the hot pitcher will burn the husks thus producing a thick cloud of smoke. Since the husks burnt with less oxygen, it will release unburned carbon particles which is black in color and attached to the surface of the clay pitcher. This process is also known as reduction firing (Abdul Rahim, 2003:166). Clay pitcher is left for five minutes until the whole body turns completely black (see 3.51 and 3.52).

The length of time to remove the clay pitcher from the firing pit to the mass of husks also influences the level of black of the clay pitcher. The shorter the time taken during the removal, the best result of the blackened effect achieved. Therefore, the distance of the paddy husks and firing pit must be very close. A strong resistance towards heat, efficiency and the speed of removing the clay pitcher from the fiery pit also plays an important role in producing the expected results. The clay body temperature will experience a sudden drop once it was removed from the firing pit and if too long time taken to remove it to the mass of husk, the blackened effect is lessened.

Scientifically, the exact maturity of the firing temperature is very important because it can influence the perfection of the blackened effect of clay pitcher. 450ºC to 500ºC is the best temperature to produce the blackened effect of clay pitcher. However the blackened effect can be achieved if the temperature is lower or higher than the said temperature but it is rather dull. This is a major problem for the traditional Labu Sayong entrepreneurs to produce an even blackened effect in one firing session. Usually the firing is led or carried out by expertise in open firing and who is experienced in controlling the fire using fuel such as bamboo and wood because the temperature is controlled only by observing the color of the ignited flames.

Burnishing technique also affects the level of black of clay pitcher. A perfect Labu Sayong that has been burnished looks shiny and smooth, and the blackened effect is more outstanding. Apart from that, the condition of the husks can also affect the blackened effect. Fresh and dry husks produce solid black color than using the burnt husks. However, the length of time the clay pitcher buried inside the husks does not affect the blackened effect. The first clay pitcher buried inside the paddy husks looks more black and shiny when compared to the clay pitcher buried at the end. Later on, the hot clay pitcher was taken out of the husks and resin was applied to the base of the clay pitcher to render it waterproof (see 3.53 and 3.54).

The innovative blackening technique of Labu Sayong introduces methods and process which is different from the techniques practiced by the existing entrepreneurs. The conventional technique practiced by Labu Sayong entrepreneurs is by placing the hot clay pitcher inside the mass of paddy husks or sawdust. The heat generated from the clay pitcher will burn the paddy husks thus producing a thick cloud of smokes. After some time, the process will give the blackened effect to the clay pitcher (Ahmad Fauzi, 1985).

Picture 3.47 Labu Sayong brought down from the rack for firing process

Picture 3.48 Labu Sayong is arranged on top of fuel

Picture 3.49 Labu Sayong is covered with fuel

Picture 3.50 Firing is started slowly before it burns completely

Picture 3.51 The firing is completed and Labu Sayong is taken out of the firing pit

Picture 3.52 Labu Sayong buried inside a mass of paddy husks

Picture 3.53 Labu Sayong turns black after it was taken out from the paddy husks

Picture 3.54 Brushing resin to the base of Labu Sayong to render it waterproof

4.0 METHOD OF STUDY

The study of blackening technique of Labu Sayong was conducted in two phases, the first was field study at Kampung Kepala Bendang, Sayong, and the second was simulation study at Ceramic Department workshop, Faculty of Art and Design, UiTM Shah Alam. Kampung Kepala Bendang was referred to because it was among the earliest villages producing black clay pitcher and Labu Sayong that is so synonymous with the local community or outsiders for ages. Therefore, the preliminary studies focused on the understanding of the method and process of firing and blackening the Labu Sayong as practiced by today's entrepreneur. Pyrometer and timer were used to obtain information involving the firing temperature and the length of time required to perform the process. After getting the needed information at Kampung Kepala Bendang, the next study focused on the construction of the testing kiln for getting the optimal result of the blackened effect based on a certain temperature. The samples were prepared using clay from the Kampung Kepala Bendang.

An up-draft kiln (Gregory, 1977) was built, somewhat similar to the one used by the entrepreneurs. The measurement of the kiln is 46cm long, 34.5cm wide and 44.5cm high. The kiln consists of four layers of insulation brick where one is for the base of the kiln, three layers for the firing chamber and another layer acts as a chimney. Even though the size of the kiln is relatively small, it is suitable for firing the small prepared samples. The best fuel for firing using this simulation kiln is gas because the circulation of the heat is more balanced without affecting the samples (Rhodes, 1968). Temperature measurement using a thermocouple and digital pyrometer type-K is fitting because it can give accurate temperature readings, and requires minimal space in the kiln.

4.1 Perak-Labu Tanah (Clay Pitcher)

The body sample used in this experiment was from the clay taken from Sayong. The clay was sun-dried, grinded finely and sieved to separate impurities. The clay powder was mixed with water and blended well, packed, and left overnight before kneading process the next day. The next step was to form the clay into semi-spherical shape as shown in Figure 1 (Billington, 1974).

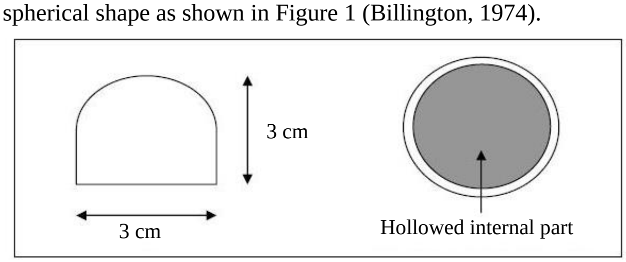

Figure 1 Cross-sectional view of the sample

The test samples were then biscuit fired with a temperature of 900°C and dipped with terra-siggilata made of Sayong clay. The sample surface was burnished till shiny, as shown in Figure 2. Paddy husks were used to produce carbon during firing by adding the husks into the kiln during the cooling process. For each sample firing, 100 gm of husks were added into the firing chamber.

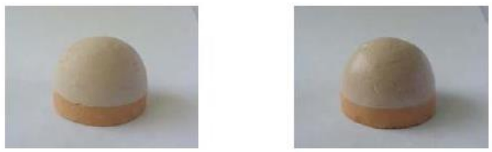

Figure 2 Test sample dipped with terra-siggilata before and after burnishing

4.2 Firing Tests

The sample firing test was performed based on 9 different temperature level at 50°C interval, which is 300°C, 350°C, 400°C, 450°C, 500°C, 550°C, 600°C, 650°C and 700°C, as shown in Table 1. Once the temperature reaches the intended level, the firing was stopped and at the same time the husks was added into the kiln through the firing chamber. Shortly after the husks were added, the hole of firing chamber and the chimney damper were closed to prevent entry of air into the kiln (NITC, 1995).

Generally, the husks will immediately get burnt or ignited by the heat inside the kiln once it was added into the firing chamber. Smoke will diffuses inside the kiln and let out little by little through a small gap. Carbon immersion was maintained until the kiln temperature dropped to 200ºC. After that, the sample was removed and cleaned.

Table 1 Firing sample

SAMPLE	**TEMPERATURE (°C)**
1.	300
2.	350
3.	400
4.	450
5.	500
6.	550
7.	600
8.	650
9.	700

5.0 RESULTS AND DISCUSSION

Based on the results of the study, there are samples that show significant level of blackened effect. There are also samples with almost the same level of black and difficult to differentiate. Figure 3 shows the test samples fired at 450°C gave the highest blackened effect. Meanwhile, the test samples fired at 500°C, 550°C and 600°C have moderate level of black, and almost identical. The test samples fired at 350°C and 650° have low level of black. The sample fired at 300°C shows very little black or greyish in color. Test sample fired at 700°C showed no blackened effect.

More quantity of husks were burnt at relatively higher temperatures compared to lower temperature, based on the remaining husk. The remains of unburnt husks were more at lower temperatures than at higher temperatures. The quantity of husks also determines the level of black. The more the husks used, the higher the level of black. However, at one level, the quantity of husks won't make any difference to the level of black.

This assumption is supported by the results obtained after the kiln was opened. In viewing the quantity of burnt husks, several factors can also be considered as a reason for the difference in the quantity of burnt husks after the fire shut down. If we observe the results achieved from the firing test at 300°C to 500°C, the quantity of burnt husk was only either one half or one third of the original quantity of 100g. Based on calculations from the difference in degrees reduction from the time the husks were added to the last smoke detected out of the kiln gap, the reduction does not exceed 200°C. This also shows a relatively short period to allow the burning of husks. In theory, paddy husks or organic material is capable of burning without direct fire because it can burn with just the heat from the surroundings as low as 300°C to 250°C.

In this experiment, it was expected that the husks will burn with only the heat left after the fire shut down and not through direct fire of fuels (Rice, 1987). The husks were still burning with limited air inside. Therefore, this may be a factor causing the incomplete burning of the husks after the air diminished. Based on observations of the firing test at 550°C, the remaining husks began to burn again with big flames triggered by the air that gets inside the firing chamber once the kiln was opened.

Some interesting questions arises; why is there successful blackened effect on samples even though the husks do not burn completely and there were also samples that failed to get blackened even though the added husks were completely burnt. This question arises from the hypothesis before the experiments were carried out that the added husks may play an important role in the mechanism of blackening Labu Sayong. It happens because the husks were completely burnt at temperatures around 650°C to 700°C including that has been absorbed fully on the Labu Sayong. In other words, all husks were burnt and released into the air. While for the unburnt husks, it was probably because firing at 300°C to 600°C, oxygen (air) was just enough to burn some of the husks that caused the blackened effect of Labu Sayong and the remaining unburnt husks was due to the temperature drop which was not enough to burn the husks.

6.0 CONCLUSION

The blackening technique of Labu Sayong commonly performed by entrepreneurs around Sayong, Kuala Kangsar is by removing the hot Labu Sayong when the firing reached temperatures around 850°C to 900°C and buried it inside the mass of paddy husks. The blackened effect of Labu Sayong has become a trade mark of its own. The proposed innovative method in this study is not intended to compete with the existing blackening technique but just to show there are still other techniques that can be explored for the purpose of blackening Labu Sayong.

Based on the results and discussion of the study of this innovative method, it is concluded that the technique of adding the husks into the kiln during the cooling process at a temperature range between 350ºC to 650ºC has been successfully blackened the test samples. If the actual Labu Sayong was used and husks were added into the kiln at any of the said temperature, Labu Sayong can get fully blackened. The initial purpose of this study has proven to be effective where the blackening of Labu Sayong can be performed without removing Labu Sayong of the kiln, thus reducing the damages, energy and fuel.

It is for certain that this innovative technique can be considered as an effort to improve the manufacturing of Labu Sayong. However, this innovative technique can be further developed in terms of kiln design, innovative materials for blackened effect and new techniques in the process of blackening Labu Sayong.

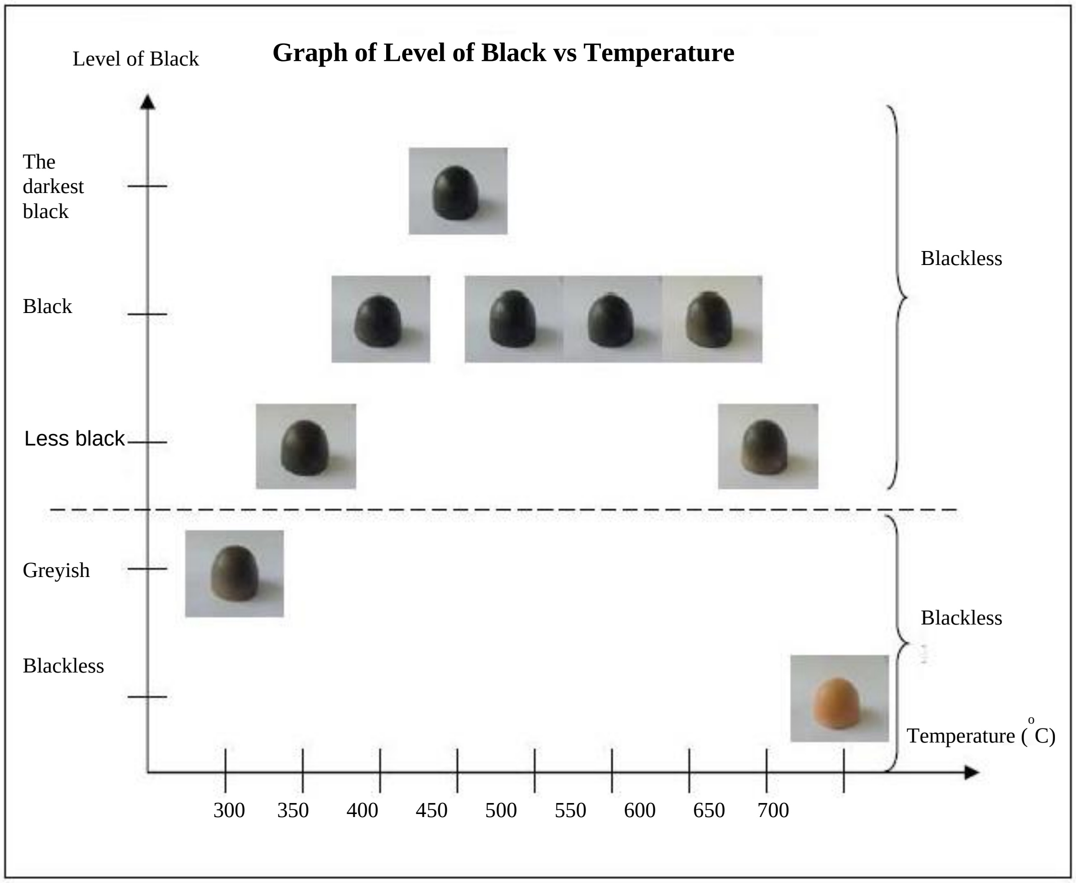

Figure 3 The level of blackened effect on samples under study

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