Contemporary artists and traditional approaches in kiln design and techniques for carbon-trapping amongst southeast Asian ceramicists

ศิลปินร่วมสมัยและแบบดั้งเดิมในการออกแบบเตาและเทคนิคการควบคุมการรมควัน งานเครื่องปั้นดินเผาในเอเชียตะวันออกเฉียงใต้

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Abstract

The ancient technique of smoke-firing transforms raw clay into functional ceramics, while the porous and unglazed ceramic surface is imprinted with carbon, creating patterns around resist materials, or blackening the surface completely. Smoke-fired pottery is a unique record of collaboration between heat, chemistry, culture and creativity. The method has its roots in traditional pottery, but its technological simplicity lends itself to contemporary artistic experimentation. Looking to smoke-firing techniques of Southeast Asian ceramic craftsmen, I demonstrate how traditional kiln design and firing techniques can be developed to support a contemporary Southeast Asian ceramic expression. While clay quality, shape, and surface texture are most often referenced to critique works of ceramic art, this investigation asserts that smoke-firing techniques for carbon control are not only an important element in achieving desired aesthetic effects, but also an essential tool in understanding social-environmental innovation and art-form.

Key Words: Smoke-firing Kiln: Carbon-trapping position control kiln in the ceramic contemporary art. Carbon-trapping: Folk wisdom to the carbon control for pottery decorating development.

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* Determining the most effective and appropriate methods of controlling smoke during kiln firing for modern asian ceramic art forms. Demonstrating how specific aesthetic qualities may be achieved using such methods of smoke control. Expressing the geometrical theorem of thoughtful innovation and design theory which connect human tradition with their natural environments.

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Introduction

The ancient technique of smoke-firing transforms raw clay into functional ceramics, while the porous and unglazed ceramic surface is imprinted with carbon, creating patterns around resist materials, or blackening the surface completely. Smoke-fired pottery is a unique record of collaboration between heat, chemistry, culture and creativity. The method has its roots in traditional pottery, but its technological simplicity lends itself to contemporary artistic experimentation. Looking to smoke-firing techniques of Southeast Asian ceramic craftsmen, I demonstrate how traditional kiln design and firing techniques can be developed to support a contemporary Southeast Asian ceramic expression. While clay quality, shape, and surface texture are most often referenced to critique works of ceramic art, this investigation asserts that smoke-firing techniques for carbon control are not only an important element in achieving desired aesthetic effects, but also an essential tool in understanding socio-environmental innovation and art-form.
Erstwhile, pottery symbolized man’s civilization. It was not only reflected an idea of innovation, established understandings toward creativity and existence, but also underlined the significant difference in human’s capability that distinguished us from all of the other species living and sharing in this same harmonious world. Furthermore, the knowledge of adapting and using natural materials, such as soil, which has already existed in the environment and noticeable the ability in shaping until delivered some fundamental technologies had made the process of creativity become touchable. Consequently, that knowledge of our ancestors has been descended from generation to generation until today. However, in the present day, the pattern of the earthen ware has been changed from the time of their origin influenced by these two factors. Widely know that the pre-historic human had created pottery in order to triturating the seeds to be ready for eating. It can also be noticed that even though, the technique and process in making those potteries to be permanent were austere conducted, and the products’ value which impacted directly to our souls was still concealed. Those values were brought passing through the limitation of time from day to day, and functioned as a perfect story teller which would allow us, the newbie to the world, perform a great research and learn something from them.

Considering about the process of making pottery of the ancestors, they had only one process which was shaping the clay. They shaped the clay by rolling or wringing it, just only for finding some methods in order to make those potteries permanent and enduring. As a result, they put those potteries in the firing process to harden the clay as their solutions. The firing was also conducted in a rustic way by digging out to make an insulated wall, but they had never thought about the wind direction in the kiln while they are firing. Another way of firing was alfresco firing. This process was done by putting the potteries altogether with some inflammable materials. By these two processes of firing, they caused some attributes to the texture of the potteries.

The attributions mentioned in the paragraph above was emerged while the fire was blazing, combined with the air that clashed with the flame converting them into carbon, to put it simply, it caused fume while the firing was processing. Thus, this fume caused by this firing process adhered itself to the potteries creating an esthetic perspective. The shapes of the potteries were illustrated by the deep and light rhythm of flame drawing an unexpected beauty. Consequently, this creativity of the unexpected beauty has been brought into the process of development in order to ease the process of firing and to make accuracy in controlling the direction of the flame.
Smoke firing

In the ancient time, the fume causing by the process of firing potteries was deniable. It caused directly from the inflammable materials such as wood or dried dung. Moreover, the way ancient people fired their potteries by putting them altogether also caused an uncontrollable fire direction. After that, in the beginning of the civilized era, the firing process was developed by heating the kiln a little by little, and also covered the kiln by the insulation preventing the losing of heat or covered the potteries with the dung. This prevention of losing heat can still be seen in the present day. Finally, after the world has entered to the process of working by technologies, the technique called ‘smoke firing’ has been invented. It creates the unexpected beauty, similar to the technique used in the past. ‘Smoking firing’ and the former technique share the same purpose which is creating the esthetic caused by the fume.

Research Scope

This research will demonstrate how smoke can be controlled and applied to achieve desired aesthetic qualities in ceramic forms. While contemporary Thai scholars and artists use clay quality, shape, and glaze technique to critique works of ceramic art, this researcher asserts that kiln techniques for smoke control are not only an important element in achieving desired aesthetic effects, but also an essential tool in understanding socio-environmental innovation and wisdom.

However, according to the study, working of smoked firing in pottery decorative of contemporary artists, in general, the chemicals or coatings are used in the texture carbon control, and carbon using to support these techniques. The artist may be endangered by the hazards of chemicals directly.

While techniques for controlling smoke during various methods of kiln firing have been utilized by traditional and contemporary cultures throughout the world, also to incorporate such effective techniques in its contemporary ceramic art forms. However, Thai cultures have traditionally applied effective smoke control techniques in kiln design for utilitarian purposes.
Research objectives

This research will:

1. Investigate and evaluate particularly effective methods for smoke control in various cultures, including traditional Thai cultures.

2. Demonstrate how these methods may be adapted and applied towards contemporary Thai artistic methods.

Research Methodology

Contemporary Thai cultures do not possess methods of controlling smoke during kiln firings for aesthetic purposes. Research must be carried out to demonstrate how traditional philosophies of innovation can be applied towards contemporary artistic endeavors in Thailand.

Therefore this research assembles many kind of knowledge for the perfect studies.

To mention about the materials is the meaning of the tradition of beauty from environment, because in the past, the human used everything from the surrounding and create it to be most aesthetics. Those affect each region to have different forms. Any raw materials have different properties that depend on sizes, kinds and humidity. This research used the different properties material to fire that influence the temperature in the procedure and to express aesthetics.
How to control smoke firing

In the past, when a human wanted to fire a product, they didn’t think to control any compositions; they just wanted a pottery to be strong, the dark value on the surface was an accident or quality loss in the work. There were many factors to make this happen, when human used low firing technique. In this research, the researcher would like to explain about natural materials in environmental factors, which can be divided into 2 groups, affect changing the elements of a pottery become the process of smoke controlling.

Materials Property
Clay bodies

There are two kinds of natural clay that can be used with the low firing technique. Each kind of it will the different identities, if other materials are used for burning. Moreover, clay will get different identities.

Raw material

There are many kinds of natural materials that give energy for firing, as hard wood that has more density than other materials. Branch and small fire wood come after leaves or dry weeds produce but the temperature doesn’t prolong for slowing time and problems will occur, if the clay’s body doesn’t have heart shock.

Results

The reaction of the experiment shows the different of value of strength’s smoke. The hard wood has not much smoke, but its temperature is high and it can keep energy for a long time. That is different from other small material. Looking at the wood when it fires out and piles to down floor, the atmosphere will become an oxidation inside to show the differences of the dark value cover area and other factors of proportion and space in the kiln. These must also affect smoke control.
Kiln ventilator air

In experimentation, ventilators air influence is variable to make a carbon on surface of products; oxygen will blow by the direction of a hold system in the kiln. Normally, in the ventilator air has makes reduction fill with blaze. And it can be in flames on the fuel point. Firstly, fuel has to burn all blaze around. After that, will be smoke that covers on the product until fuel burns out and become to charcoal. If more fuel is put and fired again, charcoal that covers the products will reach oxidation. More quantity of smoke depends on size of ventilator air.

Diagram ventilator air

Many kinds of factors that are effective for phenomenon of smoke firing and have many variables to make carbon on the surface of pottery and differences of result are too similar. In the research, there is possibility about some kinds in the point of experimental to show the important topic of issues

Variable

Variable of phenomenon smoke firing
- Size of fuel
- Kind of fuel
- Property of fuel
- Moistness of fuel
Result
- Degree heat
- Density of color and smoke firing
- Period of time to smoke firing
- Clays molecule movement in smoke firing

Kiln for smoke firing
During experiment had been found many problems to control smoke have been found. A problem about firing heating or lowering in the first makes a work break in the kiln. The kiln that is made from bricks easily, it will loss control of the direction of oxygen and materials while firing in the kiln is controlled smoke firing, the quality of deep value will be a problem. The researcher wants to design for convenience and makes innovation kiln in this experiment.

The innovative kiln
Aforementioned in the way to remedy the problem of research must be invention of an appropriate kiln to support smoke firing technique for more efficiency in processing fired. By considering system and proportion of ventilator air, Designs in the kiln depend on grounds hold that connect with the front step of the works shelf, and share two air entrances for fall a heart of temperature and keep low firing in the first step. This kiln was designed a damp on both of the loop for control temperature if it is over fired. The special thing of this innovative with on the top of centre loop can be opened and put more fuel in the moment of smoke firing system, and can be burned until the temperature and fire are die out.

Plan of the kiln
- In the kiln centre were designed step of shelf to control upper firing depend on the proportion of the kiln.

- Section of burning room to connect with centre, The burning room in collect the temperature then blow a heat to the centre keep step by step not too quickly. If control with fuel.

- Section of the kiln roof with the post to support a structure and be a ventilator entrance at the same time.

- Cover hold of the brick for protect and correct the temperature. With the material of a mud to mixed with a leftovers grass from the surrounding.

- The full side of the kiln will show the section of compete both of firing room. And empty on the centre because will lay the brick just before firing depend on size of the work.

- Front of the kiln the fire is burning and collect in hold room a temperature will break out at the damp hold upon the roof in the front section.

- Damp hold on the roof to share a temperature out before connects to room centre.

- Room centre for contain a products. It can be make more size depend on size of a works.

- Side of the kiln when the time to heat for height temperature every hold are closes to collect the temperature for longtime.

- The meter for degree observes in the experimental.
Result and Conclusion

The result of the experiment attempts to try to control smoke firing and to be evident about many logics that make a smoke composition happen. Sometimes, it is be by accident in the moment of fired it appear to beautiful marvelous on the pottery. Even though the smoke is difficult to understand because it’s a simple technique from nature. Somehow from a past of test to understand some aspect is possible to control a smoke firing in a process.

**Factor** main variable fuel

1. Row materials
2. Properties
3. Densities

**Factor**

1. Humidity
2. Ventilator air
3. Oxidation / Reduction
4. Temperatures

Now many of knowledge about artistic, Education is the most important factor to impart inspiration and a human understand to get appropriate aesthetic develop become to new style of contemporary art and integrate with another kind of technique and from knowledge of different couture just to applied which complete life. It is important to express about unity local style. To translate the meaning of spirit of life will become to human’s civilization. The experiment just tries to maintain the wisdom of the human from the past and keeps to the future. Though smoke fired it’s happened natural technique.
Upon the conclusion of the physical of material factors trial and the factors that result for carbon-trapping, the researcher has derived those results; apply to complex forms according to the form of contemporary art. In other words, forms have displayed the aesthetic, such as the distortion, the expression on the surface of work pieces, value of color on the space of form creating for balance. In addition, working solution of form in the horizon which is a barrier concerning the area of ceramics pottery smoke firing according to contemporary ceramic art forms as follows:

The various forms of products through the firing process

**Distorte form** : The distorted form based on the proportions of beauty.

**Large form** : This kiln can be operated in smoke-firing, as large area more than the general kiln.

**The horizontal form** : This kiln can also be used to control smoked carbon, to be in horizon with the air ventilator.

**Basic form** : Beauty of the smoked carbon on the basic shape with not smooth surface made the more complex dimension and attractiveness.
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