

“The Guardian Scarabs” exhibition 2019 presenting: Artistic dimensions of Inserting glazed talc within basalt Sculptures

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ABSTRACT

This research paper discusses the philosophical and technical approaches presenting “The Guardian Scarabs” exhibition by identifying technical methods of forming Vitriified Talc, inserted over Basalt Sculptures, it aims at discovering aesthetics of Vitriified Talc shapes Inspired from ancient Egyptian Scarbs, in new forms of expressions. Experimental research methods were used to present practical applications of Scarabs shaping realized in stylized abstract forms of Egyptian Talc stone (Steatite), fired and glazed at 980°C, then mechanically fixed over the Cocoon stylized Basalt Sulptures’ polished surfaces, resembling the guarding of these Cocoons awaiting Metamorphosis. The research deepen an understanding of Metamorphosis Concept embodied in Cocoons, being a biological fact, and revealing social reoccurring Ideas. The particular significance of the study lies in spotting light on developing Ancient Egyptian techniques, it makes important contributions to enrich technical information about Egyptian Talc stone Sculpture, Firing, and Glazing, to reveal special Aesthetics emphasized by integration of turquoise glazed Talc within Black Basalt, rising an interesting dialogue between two different and even visually opposite fiery bodies, showing contrast and integration between them. This research reccomends paying attention to polimateric techniques, since diffent materials combinations create new languages and forms of expression.

KEYWORDS: Glaze, Talc, steatite, Basalt, Sculpture

1. INTRODUCTION

This research discusses a group of Sculptures introducing " Artistic dimensions of inserting glazed talc within basalt Sculptures " by embodying Stylized Cocoon shapes which reflect the idea of “Metamorphosis” being symbols of transformation, renewal and rebirth... Metamorphosis, the natural process that creatures undergo in order to evolve, while they are stripped of their bodies to reach the completion that ensures the continuation of their lives’ purpose.

A "dialogue of shapes and colors" is presented through the stylized cocoons, sculpted in solid volcanic black basalt rocks, maifesting strength and mystery, and the glazed talc stylized Scarabs lies

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on the Cocoons' surfaces, inspired from Ancient Egyptian Talc (Steatite) Scarabs with a hematite and turquoise colored surface associated with protection and development.

The works are an Optical integration between two different materials, derived from ancient mixed media use. The Ancient Egyptians used various material insertions in different forms.

Continuously, sculpture though Middle Ages inherited the use of mixed media, defined as polimateric (or polymateric) technique, the use of materials was determined by specific purposes, to heighten the realism, to ennoble the figure, to convey symbolic meaning, and more. (Fachechi, 2011)

The research presents Talc stone sculpture and glazing techniques to create Sculpture insertions which can rise an understanding of Metamorphosis Concept embodied in Symbolic Cocoons, being a biological fact, and revealing social reflections.

The particular significance of the study lies in emphasizing the importance of developing Ancient Egyptian techniques, making important contributions to enrich technical information about Egyptian Talc stone Sculpture, Firing, and Glazing.

1.1. Problem statement

This research problem is concerned by identifying technical methods of Forming Vitriified Talc Sculptures , inserted in Basalt.

1.2. Research Aim

This research aims to discover aesthetics of Vitriified Talc shapes Inspired from ancient Egyptian Scarbs, in new forms of expressions through inserting them over Basalt.

1.3. Objectives

The research will present technical information and practical procedures to investigate the materials' shaping abilities and boundaries.

1.4. The Rationale

This study rises the importance of developing ancient techniques in expressing ideas related to Identity roots, and Social transformations.

1.5. The Significance

The research tackles the Concept of Metamorphosis, embodied in Cocoons, to reveal Social situations and processes, besides rising symbols of Protection and Recreation.

The particular significance of the study lies in spotting light on developing Ancient Egyptian techniques, it makes important contributions to enrich technical information about Talc stone Sculpture, Firing, and Glazing.

1.6. Limitations

This research is determined by using Egyptian Steatite and Basalt Stone Sculptures.

1.7. Methodology

Experimental research methods were used, the practical application, investigation of techniques, and analysis, proceeded in this research, in parallel with collecting topic-related data of Talc processing and vitreous glazing.

2. Theoretical Framework:

2.1 Research Terms Definition

- Talc stone

It is Green/grey/brown coloured metamorphic rock (Szafran, 2017) known as Steatite or Soapstone, which is composed of varying proportions of the mineral talc, often combined with other minerals such as chlorite and carbonate. (Eurotalc, 2022)

- Polimateric techniques

In Latin, Poli meaning Many, and materic meaning materials, polimateric Techniques defines Superimposition, Insertion, and Juxtaposition, according to the ways in which the materials were combined. Polimateric sculpture by Superimposition represents the presence of multiple materials hidden or at least obscured like polychromy, where The basic sculptural form is rendered in a single material, but finished in paint or covered with metal plate. Insertion shows the presence of materials with a predominantly ornamental function set into the surface without compromising the basic design and identity of the work, featuring simultaneous visibility of various materials, including goldsmith work. Juxtaposition presents various components in full view, each component has a role to compose the design. It is realized through a simultaneous mixture of heterogeneous materials, either from different qualities of the same material, or the simultaneous mixture of different materials made by distributing forms in space and is therefore structural. (Fachechi, 2011)

2.2 Literature Overview

Ancient Egyptians considered the scarab (*Scarabaeus sacer*) a renewal and rebirth symbol, associated with the Sun God as scarabs roll balls of dung to lay their eggs, resembling the progression of the sun from east to west. While eggs hatched from this ball, it was seen as a spontaneous creation, giving the beetle an association with the Sun God’s (Khepri) creative force. Scarab amulets were used for magical rejuvenating properties, healing and protection (Fig.1). Steatite was widely-used in Ancient Egypt, as a soft schistose stone, used as a sculpture medium, due to being more affordable or available, and also because of the material’s ability to be intricately carved and fired. (Foley, 2022)



Fig.1 Scarab, Turquoise-glazed Talc (Steatite), 1.6 cm
1648–1540 BC, Egypt, Second Intermediate Period (Scarab, 2022)

Talc deposits are formed through the transformation of the original rocks by the hydrothermal activity. The compounds required for talc formation are MgO, SiO₂, H₂O. Such transformation process requires a certain geological context which takes place under low to medium temperature and pressure metamorphism, which is also affected by the tectonic movements. The lamellarity or platyness of the mineral is a feature determined by the pressure applied during or post transformation when the increase in pressure increases the lamellarity while the decrease of the former leads to decrease in lamellarity. (Eurotalc, 2022). So Talc is a naturally occurring mineral, mined from the earth, composed of magnesium, silicon, oxygen, and hydrogen. Chemically, talc is a hydrous magnesium silicate with a chemical formula of Mg₃Si₄O₁₀(OH)₂ (Talc-FDA. 2022)

A classification of the parent rocks talc is classified to: Magnesium carbonates deposit, Serpentine deposit, Alumino- silicate rocks deposit, and Magnesium sedimentary deposits.

Different products occur as result of the diversity of origin and types, and such products vary according to their mineralogical composition, color and crystalline structure either micro- crystalline or lamellar.

The talc mineral elementary sheet consists of one layer of magnesium- oxygen/ hydroxyl octahedral between two layers of tetrahedral silica. As the main surfaces; these are, basal surfaces in the elementary sheet lack both hydroxyl groups and active ions, thus rendering it hydrophobic and inert.

As for the size of an individual talc platelet (thousands of elementary sheets), it varies from 1 micron to over 100 microns, according to the formation conditions of a sheet, and this size of platelet is the determining factor of talc's lamellarity. Talc of high lamellarity has large individual platelets, while the microcrystalline talc has small platelets. Within the elementary sheets that are stacked on top of each other, the force known as Van de Waal's force, as the binding force between those sheets, which happens to be a weak force, thus explaining the easy sliding of platelets by any simple touch thereof, and the difficulty of controlling the safeness of large blocks.

Talc five major characteristics, defining it as a unique substance, include: Lamellarity, chemical inertness, affinity for organic chemicals and whiteness and softness (Eurotalc, 2022). Talc degree of hardness of Mohs Scale is 1. Compared with other materials such as bronze with hardness of Mohs 3, bone with hardness of Mohs 2.5 and flint with hardness of Mohs 7; which makes e talc easily workable using basic tools.

The Egyptian Steatite exists in the sites of Wadi Abu Qureya in the eastern desert and the north and south if Wadi Barramiya. The use of steatite in ancient Egypt during the Pre- dynastic and dynastic eras was limited to small statues as large sections thereof were quarried. Yet, steatite was not used in larger statues because of its softness which renders it easily damageable. Nevertheless, firing it will result in transforming it into Enstatite, undergoing natural darkening due to oxidation. Enstatite's hardness is Mohs 5.5, hardness close to that of Granite. So it is extremely hard. (Szafran, 2017)

The light natural colour of the stone was not appreciated for the production of Egyptian Scarabs, and was covered by means of a blue or green glaze. (Sparavigna, 2016) Talc was glazed since the Pre-dynasty era and such glazing would be carried out through being buried in a glazing medium during firing; cementation, or through painting the surface pre- firing using powdered copper and quartz, giving blue/ green color. (Szafran, 2017) Glazed Talc represents one of a range of early vitreous materials which include glass and Egyptian ceramics. These materials, were used in Egypt and the Near East from the fourth millennium BC onwards to produce small objects such as beads, rings, scarabs, small figurines. (Tite, 2022)

3. Applications

The Stylized Talc Scarabs in this research were formed by carving and abrading with electric and manual tools, in the soft Egyptian light colored steatite lamellar forms, from 5 to 20 cm in length (Fig.2.1, 2.2)



Fig.2.1 Steatite



Fig.2.2 electric grinder Shaping



Fig.2.3 sand paper treatment

3.1 Talc Firing treatment

The steatite Scarbs (Fig. 2.3), were then fired (a first firing) to enstatite before applying the glaze.

When exposed to high temperatures, the talc undergoes progressive loss of the hydroxyl groups therein and re- crystallization to become different forms of Enstatite (anhydrous magnesium silicate) and talc has the melting point of 1500° C (Eurotalc, 2022)

In a firing schedule at the practically constant rate of 6° C per minute, previous researches indicated no change in the crystal structure of the talc up to 800° C. At 800 to 840° C talc decomposed to enstatite, amorphous silica, and water vapor. The enstatite changed to clinoenstatite around 1200° C, and the amorphous silica changed to cristobalite around 1300° C, giving clinoen-statite and cristobalite as final product. The X-ray patterns show that, a sample heated at 840° C, which has undergone the rapid loss in weight, has changed to enstatite and amorphous silica: $4\text{MgO}\cdot 5\text{SiO}_2\cdot \text{H}_2\text{O} \sim 4(\text{MgO}\cdot \text{SiO}_2) + \text{SiO}_2 + \text{H}_2\text{O}$. Enstatite appears to remain the only crystalline phase up to about 1200° C, at which temperature a gradual inversion to clinoenstatite is in progress. cristobalite first appeared at 1300° C. (Ewell, 1935)

This current research first firing was performed to 900 °C as shown in (Table .1)

Table 1. Talc first Firing schedule.

Step	°C
170°C/hr	to 120 °C
170°C/hr	to 745 °C
60°C/hr	to 900 °C
0°C/hr	to 30 °C

3.2 Vitreous Glaze application

Glazes are composed of three key components, mainly Silica being the glass former, Alumina being the portion that 'shrinks-to-fit' on body, and Fluxes to lower the melting point of the Silica. (Glaze Composition, 2022) According to a research examining the glazing of ancient Egyptian Talc,

glazes of 5- 9% of copper oxide concentration and 8- 10% of magnesium oxide formed a continuous glass on top of the surface, as well as, a silica- based glaze mixture in the form of a pre- fired frit. In other cases a direct application method of glazing used a mix of 70% ground flint, 9% sodium carbonate, 13% potassium bicarbonate and 8% malachite, a mixture that was discovered through the analysis of a Talc vessel. The application of the glaze mix in samples fire at 950 C, applied either in raw state or as a pre- fired frit, resulted in forming a continuous glass cover on the surface. The body witnessed the diffusion of a significant amount of alkali into the body from the glaze used in the pre- fired frit form, which results in the formation of a definite glaze- body interaction phase (Tite, 2022)

Another ancient Egyptian vitrified glaze coat was identified as shown in (Table. 2): (Lilyquist.C, 1993)

Table 2. ancient Egyptian vitrified glaze.

constituent	%	constituent	%
Si ₂ O	80	MnO	-
Na ₂ O	0.7	CuO	5.8
CaO	4.6	CoO	-
K ₂ O	2.5	PbO	-
MgO	0.8	SO ₃	1.6
Al ₂ O ₃	1.4	Cl	0.9
Fe ₂ O ₃	0.7	P ₂ O ₅	-
Ti ₂ O	0.1	MnO	-

In this current research, the enstatite were coated with glaze frit, using brushing, since firing the frit on (crude/unfired) steatite showed uneven glaze coat result (Fig.3.1), but a smooth glaze was obtained at 980° C by its application on Enstatite (prefired Talc) (Fig.3.2).

The main colors aimed to produce turquoise and hematite black where obtained through several experiments testing different glaze compositions, where the most relevant composed with a low fire (980) leadfree base glaze frit depicting a turquoise and hematite black colors with the following composition (Fig.3.3), (Fig.3.4):



Fig.3.1 Glaze fired on Raw Talc (steatite)



Fig.3.2 Glaze test on fired Talc (Enstatite)



Fig.3.3 Scarabs glazing

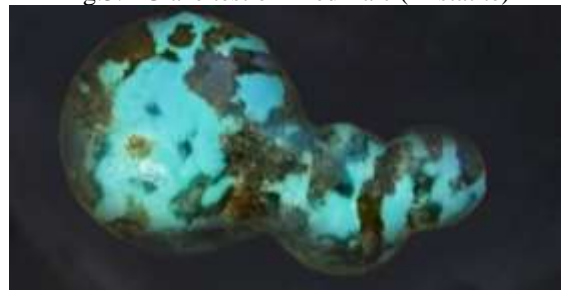


Fig 3.4 Vitrified enstatite Close-up

- **Turquoise glaze:** 70% white mat frit : 30% transparent brilliant frit + 3% Copper Oxide

- **Hematite black glaze:** 100% transparent brilliant frit + 5% Copper Oxide +2% Red Iron Oxide+ 1% Manganese Oxide

This Glaze firing was performed as shown in (Table. 3):

Table 3. Glaze firing Schedule

Step	° C	Hold	
60°C/hr	to 121°C	60min	Drive out any remaining mechanical water
194°C/hr	to 980°C		Optionally soak here 10 minutes to clear bubble clouds

3.3 Basalt stone Preparation:

Egyptian Basalt stone, was used in this research paper with their solid and hard aspect to emphasise the protective bodies of the stylized coccons bearing the Vitreous Glazed Talc Stylized Scarbs.

Basalt is one of the rocks of high availability on earth. It is a volcanic and igneous rock that is created through the cooling and solidification of lava or magma. The igneous rocks can be classified into two categories, intrusive or extrusive, The former type of rocks, intrudive, such as granite is usually formed as the lava or magma solidifies into larger mineral crystals under the surface of earth in a very slow process and the later type of rocks, extrusive, are the one that solidifies rapidly above the surface of earth and under the water such as basalt (BauMart Natural Stone.2022). As for the chemical composition of basalt is; 45–52 wt% SiO₂, 5–14 wt% FeO, 14 wt% or more Al₂O₃, 2–5 wt% alkalis.

While the contents of both, MgO is about 5- 12 wt% and CaO is around 10 wt%. The basalts of high alumina content have 17- 19 wt% of Al₂O₃. The magnesium MgO content of boninites is up to 15%. As for the rare mafic rocks rich in feldspathoid they have the contents of Na₂O + K₂O reaching 12% or more (Irvine, 2022) The rapid formation of the rocks would mean that the extrusive rocks have small crystals that can be distinguished by human eye. These rocks texture is aphanitic. As the magma that forms the extrusive rocks cools already before eruption, some larger crystals have already been created, describing this as porphyritic extrusive rock. Basalt is also grouped in the category of mafic stones, these are, stones with high content of both iron and magnesium, thus rendering them of rich dark color; grey, black or green. Basalt color can turn into red or brown color due to oxidation of iron’s content in the rock (BauMart Natural Stone.2022).

The 10 Basalt stylized Coccons in this research are of solid black uniform nature, Sculpted by coarse diamond grinding discs, and polished with diamond wet discs gradually rising from 36 till 3000 grit (Fig.4.1to Fig.4.12).



Fig.4.1 Egyptian basalt



Fig.4.2 irregular rock



Fig.4.3 Sculpture process



Fig.4.4 Sculpture process



Fig.4.5 Sculpture process



Fig.4.6 Sculpture process



Fig.4.7 Sculpture process



Fig.4.8 Sculpture process



Fig.4.9 Sculpture process



Fig.4.10 Sculpture process



Fig.4.11 polishing



Fig.4.12 Talc integration

3.4 The Sculptures representations:

In the “Gaurding Scarabs” series of sculptures, differently sized groups of basalt Forms were exhibited (Fig 5.1 to Fig 5.13) varying from 25 x 18 x 12 cm, to 55x35x25 cm, with evident exaggeration of real living cocoons and scarbs sizes, to give importance and grace to the metaphor. (Fig 6.1 to Fig 6. 3)

Ten different configurations of Stylized cocoon sculptures were represented in a sequence of works of Egyptian basalt, bearing insertions of stylized Glazed Talc Scarbs... expressing thoughts of Metamorphosis, between struggle of regenerating creatures, and protection of Cocoons shells and guardians. The interpretation uses nature not as subject matter to be represented but as source of ideas.

The physically heavy masses of Sculptures came in various representations, varying from more round, to oval, to cone shaped, and different smooth combinations, in a sequence of irregular organic arrangements, floating in space by erecting each of them on a single axis.

The intersecting planes of Vitrified talc with Basalt created metaphorical connotations, the sculptures drew attention to their essential materiality and to both stones intrinsic aesthetic qualities.

The Basalt forms recall the material’s use in ancient Sculpture and land constructions – an association underscored the strength and durability of the material emphasizing the concept of protection- these forms presented a ground for the Talc Scarbs insertions, symbolizing protection and recreation inspired by the ancient Egyptian Culture, in a contest of Polimateric Technique, to stimulate the viewers thoughts about hidden values and meanings in Shapes and Colors.



Fig.5.1 Cocoon 1: Measures 55x35x25 cm , with 2 Talc insertions of 3 and 15 cm length



Fig.5.2 Cocoon 2: Measures 50x35x20 cm , with 2 Talc insertions of 10 and 15 cm length



Fig.5.3 Side Views of Cocoon 1 and Cocoon 2



Fig.5.4 Cocoon 3: Measures 45x25x20 cm , with 2 Talc insertions of 10 cm each



Fig.5.5 Cocoon 4: Measures 45x25x20 cm , with 1 Talc insertions of 10cm length



Fig.5.6 Side Views of Cocoon 3 and Cocoon 4



Fig.5.6 Cocoon 5: Measures 30x25x20 cm , with 2 Talc insertions of 5 and 10 cm length



Fig.5.7 Cocoon 6: Measures 28x24x20 cm , with 1 Talc insertions of 5 cm length



Fig.5.8 Cocoon 7: Measures 35x25x15 cm , with 2 Talc insertions of 5 and 10 cm length



Fig.5.9 Cocoon 5 Side View



Fig.5.10 Cocoon 6 Side View



Fig.5.11 Cocoon 8
22 x 16 x 12 cm



Fig.5.12 Cocoon 9
28 x 15 x 12 cm



Fig.5.13 Cocoon 10
25 x 18 x 12 cm



Fig.6.1
Part of Exhibition at “Khan El maghraby” on
reinforced pedestals, Cairo, 8:19 Jan.2019



Fig.6.2
Exhibition Opening



Fig.6.3
Closeup with 2
Cocoons

Results:

- The effectiveness of the material was a key to present aesthetic and expressive aspects in the works, using the grace of vitrified Talc inserted over the majesty of the Basalt which possessed the characteristic of strength and durability.
- The researcher relied on the energy of natural stones and glassy materials to suggest the expressive and aesthetic dimensions according to a precise controlling of shaping and processing techniques.
- Desired visual effects were obtained through Technical experimentation of Glazing, which was precisely achieved by Glazing Enstatite (fired Talc) rather than steatite, creating a Turquoise glaze of 70% white mat frit : 30% transparent glossy frit + 3% Copper Oxide, and a Hematite black glaze of 100% transparent glossy frit + 5% Copper Oxide +2% Red Iron Oxide+ 1% Manganese Oxide.

4. Conclusion:

Materials were not just a medium that shapes a form, but rather a medium that reveals expressive and aesthetic values .

Using polimateric techniques, like insertion of the Glazed talc over Basalt Sculptures, contributed to the production of innovative works.

The reseach Experimental study investigated Talc stone Carving and vitroues glazing with leadfree fritted ceramic glaze, using a prefired frit for glazing in direct application, using brushing, after udergoing drying as a first firing stage in electric Kiln at 900° C , Since firing the frit on a crude (unfired) steatite showed uneven glaze coat results, but a smooth glaze was obtained at 980° C by its application on a fired Talc. The main colors aimed to produce turquoise and heamatite black where obtained through several experiments testing different glaze compositions, where the most relevant composed with a base glaze, was a Turquoise glaze of 70% white mat frit : 30% transparent glossy frit + 3% Copper Oxide, and a Hematite black glaze of 100% transparent glossy frit + 5% Copper Oxide +2% Red Iron Oxide+ 1% Manganese Oxide.

The particular significance of the study lies in spotting light on developing Ancient Egyptian techniques, it makes important contributions to enrich technical information about Talc stone Sculpture, Firing, and Glazing.

5. Recommendations:

- Glazed Talc has a fertile potential for shaping small to medium size shapes, being treated with firing and glazing to alter different characteristics, reflecting aesthetic and cognitive values.
- It is reccomended to pay special attention to polimateric techniques, since diffent materials combinations create new languages and forms of expressions.

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الجعارين الحارسة

"الأبعاد الفنية في دمج حجر التلك المزجج في نحت البازلت المجسم"

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الملخص

يتناول البحث مناقشة الأبعاد الفلسفية والتقنية، التي تمثل معرض (الجعارين الحارسة) من خلال تقديم تقنيات تشكيل التلك المزجج، و يهدف الى اكتشاف جماليات التشكيل في التلك المزجج المستوحاة من الجعران المصري القديم، في صيغ تعبيرية جديدة. تم استخدام وسائل البحث التجريبية لتقديم تطبيقات عملية في تنفيذ مجسمات الجعارين في أشكال مجردة من حجر التلك المصري "الستياتيت"، والتي تم حرقها وتزجيج سطحها في درجة حرارة 980 درجة مئوية، ثم تثبيتها على منحوتات بازلت على أشكال شرائق محورة؛ بحيث تمثل شكل الجعارين التي تحرس تلك الشرائق في انتظار إتمام تحولها، فيعمل البحث على تعميق فكرة "التحول" **Metamorphosis** المتجسدة في الشرائق؛ كونها حقيقة بيولوجية، تكشف عن أبعاد اجتماعية متكررة.

تكمن الأهمية الخاصة للدراسة في إلقاء الضوء على تطوير التقنيات المصرية القديمة، وتقدم مساهمات هامة لإثراء المعلومات الفنية التقنية الخاصة بنحت وتزجيج حجر التلك المصري؛ للكشف عن جماليات خاصة تم إظهارها من خلال دمج التلك المزجج بلونه الفيروزي والأسود مع البازلت الأسود، مما أظهر حوار شيق بين جسمين مختلفين ومتضادين ظاهرياً، لتأكيد التباين والتكامل بينهما.

ويوصى البحث بإيلاء اهتمام لتقنيات تعددية الخامات، حيث أن تركيبات المواد المختلفة تنتج لغات وأشكال تعبير جديدة.

الكلمات الدالة: جليز، تلك، بازلت، ستياتيت، نحت

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