# The impact of Environment Friendly Gelatin Printing on Artistic Printmaking

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## Summary:

Gelatin printing is considered a unique form of printing in terms of the preparation methods of the gelatin plate, which the artist can make themselves and determine its size and shape. The printing process also varies because the gelatin plate retains the impression of the print and in the printing techniques.

Gelatin printing is similar to monotype printing in terms of the number of copies, as the same print cannot be repeated, making it also monotypic. It shares with monotype printing the characteristic of non-repeating the printed copy.

Monotype printing can be versatile as it can be integrated with any other type of printing. It can be combined with modern printing programs like ( AI ) or converted into 3D, or incorporated with other types of printing.

For successful gelatin printing, there are many conditions to be met, with the most important step being the preparation of the printing plate itself. There are standard ratios that the artist must follow in order to achieve the printing plate that leads to the success of the artistic work. There are steps in both preparing and printing the plate.

One of the advantages of gelatin printing is that it is environmentally friendly because the artist can make the gelatin plate from food materials such as gelatin and medical materials such as glycerin. This leads to preserving the environment and the artist who produces artistic work.

Also, one of its features is that it promotes the idea of recycling by using old, damaged fabrics and textures, as well as faded paper in artistic printing. This transforms them from obsolete items into beautiful artistic works with a special character.

This research explored the history of Gelatin printing, its various methods of practice, as well as its different names. An environment friendly gelatin template was created at minimal cost compared to other artistic prints, and printing was done on it.

## Keywords:

Gelatin printing - AI programs - three-dimensional printing - Monotype printing - Hectography - Jellygraph - Gelatin Duplicator

## الملخص:

تعتبر الطباعة الجيلاتينية مختلفة عن غيرها من حيث طرق إعداد القالب الجيلاتينى الذى يمكن للفنان أن يصنعه بنفسه ويحدد مقاسه وشكله أيضاً تختلف فى طريقة الطباعة لأن القالب الجيلاتينى يحتفظ بملامس طبعته وكذلك فى طرق التحبير.

تشبه الطباعة الجيلاتينية الطباعة الأحادية من حيث عدد النسخ فلا يمكن تكرار نفس الطبعة فهى أحادية أيضاً فهى تشترك مع الطباعة الأحادية فى صفة عدم تكرار النسخة الطباعية.

الطباعة الجيلاتينية يمكن أن تكون مرينة فهى قادرة على الدمج بينها وبين أى طباعة آخرى ويمكن أدخالها مع الطباعات الحديثة مثل برامج الزكاء الإصطناعى AI أو تحويلها لتكون ثلاثية الأبعاد أو تشكيلها مع طباعات آخرى
للطباعة الجيلاتينية شروط عديدة لنجاحها ويعتبر أهم خطوة هو إعداد القالب الطباعى نفسه ويوجد له نسب قياسية يجب على الفنان إتباعها ليحصل على القالب الطباعى الذي يليه نجاح العمل الفنى فهو له خطوات فى إعداده كذلك فى طباعته.
من مميزات الطباعة الجيلاتينة أنها صديقة للبيئة لأن الفنان قادر على صناعة القالب الجيلاتينى من مواد غذائية كالجيلاتين ومواد طبية كالجلسرين وهذا يؤدى إلى الحفاظ على البيئة وعلى الفنان الذي ينتج عمل فنى.
وأيضاً من مميزاتها أنها تعزز فكرة إعادة التدوير وذلك عن طريق إستخدام الأقمشة والملامس القديمة التالفة وأوراق الشجر الذابلة فى الطباعة الفنية ليؤدى ذلك إلى تحويله من أشياء بالية إلى أعمال فنية جميلة لها طابع خاص.
تم دراسة تاريخ الطباعة الجيلاتينية وطرق ممارستها المختلفة وأيضاً أسماءها المختلفة وتم صناعة قالب جيلاتينى صديق للبيئة بأقل التكاليف بالمقارنة مع الطباعات الفنية الآخرى، وتم الطباعة فوقها.

**الكلمات المفتاحية:**
الطباعة الجيلاتينية – برامج -AIثلاثية الأبعاد- طباعة أحادية

## 1. Introduction

The name "Gelatin print" is given because it is based on the use of gelatin in its manufacturing process, as it has standard proportions in production. Gelatin powder is added to hot water, then the mixture is poured into any mold chosen by the artist in terms of shape and size according to their artistic work.

Other names for gelatin printing include: Hectography, Gelatin Duplicator, and Jellygraph. They can be made from food-grade gelatin powder.

There are standard proportions for making gelatin molds, which are: 375 ml of glycerin, half a cup of cold water, added to 115 ml of gelatin powder, then two cups of hot water are added. The ingredients are heated until boiling, then the mixture is poured into a mold until it sets and becomes a printable gelatin mold. (Kim Herringe-Gelatin Plate Printmaking Recipe-9-3-2-18)

Gelatin printing is based on layers, where the artist uses printing backgrounds and on top of them, they apply textures, drawings, or by the artist printing on top of them using paper printed with natural landscapes using inkjet or laser ink, and creating a background on top of it after printing on it to make it appear. It is considered a collection of artistic styles created by the artist on the gelatin template, and two or three colors can be used in producing a single artwork.

Gelatin printing is a flexible plate that allows artists to create single copies, sometimes referred to as Hectography. The gelatin template is expensive to purchase, but artists can make it themselves at a low cost. It is similar to a silicone template, as when gelatin is heated, it becomes sticky. Some artists add alcohol to facilitate the integration between water and gelatin.

One of the advantages of gelatin plate printing is that the plate is capable of printing fine details, allowing the artist to print their fingerprint and all intricate details. This is because the gelatin plate surface is both wet and dry, and the artist must maintain the plate's surface. When using plastic or hard tools, the gelatin plate surface may be damaged unless the artist intentionally wants that in their artwork.

The artist can add any textures and backgrounds they want to print, as well as stencil paper and writings. Due to the template's surface, it prints all the fine details, and it can be used as a collage or as printing backgrounds for printing other designs on top of them.( Julie Richards-How to make a gelli plate at home-creativefabrica.com)

Some artists use a gelatin template in drawing and printing by drawing on top of the gelatin template, allowing the artist to draw freely and add fine details to their drawing. After finishing the drawing, they place a paper on top of the gelatin surface and take a print of it with all its details due to the flexibility of the surface, allowing the artist the opportunity to be creative in their drawing and convert it into a monotype print using a gelatin template. Look at figures ( 5, 6 and 7) (Whitney Panetta-Gelli Printmaking Process+ Painting- Look Between The Lines).

## 2. Materials and Methods:

### 2.1 Problem of the research

The problem of the research is summarized in a number of questions:

1) Can gelatin printing solve the issue of rising printing materials?

2) Is it necessary to follow the standard proportions in making a gelatin printing plate?

3) Should the gelatin mold be stored in a cool and dry place to preserve it because it is made from natural and food-grade materials?

4) What is the substance that is added to acrylic colors to slow down the drying process?
It dries quickly because it is fast-drying colors.

5) Does the scarcity of scientific references in gelatin printing make it difficult for the researcher to carry out his tasks?

### 2.2 Research objectives

1) Enhancing the value of artistic work and that the artist is capable of producing artistic work different from modern technology programs such as AI.

2) Recycling and converting waste materials like old fabrics into printed artistic works.

3) Using modern technical methods and keeping up with the technology era, and integrating them with software to create innovative artistic patterns.

### 2.3 The importance of the research

The importance of the research lies in enhancing and enriching the artistic edition and promoting the idea of manual printing, which is at risk of extinction due to modern technology programs.

### 2.4 Research methodology

Historical – Experimental

## 3. Structure:

### 3.1 Some of Gelatin Printing Artists

### 3.1 Kim Herringe

An Australian artist who works in the field of printmaking, especially Monoprint, and holds workshops in this field, she spent 30 years working in graphics design, advertising and she is exploring traditional and new printmaking media, (her date of birth was not indicated). (Kimherringe.com.au-9March,2018)

**Figure no. (1) shows the Gelatin printing by Kim Herringe**

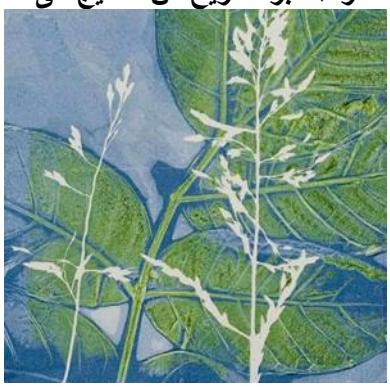

**Figure no. (2) shows the Gelatin monoprinting by Kim Herringe**

**Figure no. (3) shows the Gelatin monoprinting by Kim Herringe**

**Figure no. (4) shows the Gelatin monoprinting by Kim Herringe**
**(Kimherringe- Gel Plate Printing tip-printing a white silhouette -june 3,2019)**

### 3.2 Whitney Panetta

An art teacher who taught art for up to twelve years, living in Atlanta, Georgia State, worked in art printing and worked to teach her students the field of art edition. She studied art and her Master degree is in Art Education at University of Georgia. (her date of birth was not indicated).

**Figure no. (5) While the artist (Whitney Panetta) was drawing and printing using the gelatin plate.**

**Figure no. (6) illustrates artist (Whitney Panetta's) process of creating gelatin prints through drawing.**

**Figure no. (7) illustrates the work of artist (Whitney Panetta) in gelatin printing**.
**(Whitney Panetta-Gelli Printmaking Process+ Painting- Look Between the Lines)**

### 3.3 History of Gelatin Printing

Gelatin printing was known as Hectography, and it was used secretly, which was necessary in the early 20th century and late 19th century. It was used in newsletters for churches, prisoners of war, and in Colditz Castle during World War II, as well as by communist authorities in Jiangxi-Anhui, a border region in China.

It was a series of postage stamps issued in November 1948 for the production of warning documents for prisoners of war at that time. They were also later used in artistic works, where Russian artists used them in creating art books with illustrations. Subsequently, German artists used them in artistic and professional works, such as the German expressionist artist (Emil Nolde). He is an artist and printer born in 1867 AD, as well as the American artist Stephen King who used it in his book "On Writing"and used it with his brother Dave's Rag in creating a newspaper in the fifties and sixties of the last
century(https:/en.wikipedia.org/wiki/Hectograph).

It is evident that gelatin printing has been around since ancient times, but because it was practiced secretly, it is difficult to determine the exact history of its emergence or the region where it originated. However, its first appearance is considered to be in China, but this cannot be confirmed.


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**Figure no. (8) illustrates the use of Hectography printing in advertising in the 19th century, which involved fixing a gelatin template on a Metal surface.**
**(https://en.wikipedia.org/wiki/Hectograph)**

It is mentioned in some scientific references that this technique is derived from the Babylonian civilization in Iraq, where the Babylonians used cylinders for signing and printing on clay templates in 1780 AD. The clay templates were later replaced with gelatin templates, and the gelatin template was not extracted from the temporary template into which the gelatin material was poured.

Similarly, it was also used in commercial activities in the 1950s due to the increase in trade between the United States and Britain and commercial expansion at that time. The dyes were made of a substance called Aniline, which was a purple or blue color. This was done by transferring the Aniline substance from the inked paper to a gelatin plate, pressing it onto the gelatin plate. Due to the moisture on the gelatin surface, the image would transfer to the plate, and then it would be printed using traditional methods and pressed by the artist's hand or a roller. (Robyn Tait-Hectpgraphs - their History, Technology and Conservation Treatment –A Preliminary Survey-p65-67-Published online 15 Jun 2015)

### 3.4 The Originality of the Artistic edition and its relationship to Gelatin printing

The originality of the artistic edition and its requirements is linked to the extent of enriching it with various techniques such as gelatin printing, which can add to the field of artistic printing that relies on manual artistry, which has decreased in use due to technology programs and artificial intelligence programs, The factor that led the researcher to explore a technology that benefits and enriches artistic printing is its ability to print fine details in different ways. It allows drawing on the printing plate and can be printed as monochrome printing. It can also print through images printed with laser technology, as well as texture printing that can reach the level of fingerprint printing due to its high precision and surface moisture.

All of this leads to enriching the artistic edition, but gelatin printing lacks the quality of repetition as it falls under the concept of monotype printing in terms of losing the quality of repetition. However, it has a special character that distinguishes it from various types of printing. Also, the idea that the artist has manufactured his artistic mold himself leads to his feeling the value of the artistic work he produces. The mold itself becomes part of the artistic work that the artist shaped, determined its size, and thickness. (The researcher)

Artistic printing (printmaking) is characterized by flexibility, and despite the huge technological advancements, it is able to maintain its authenticity. It can also adapt to all other technologies, as it is constantly evolving, allowing the artist to excel and innovate in their artistic work to create new and advanced artistic styles that are in line with the times and have a unique character because they are executed manually. This distinguishes them with authenticity. They can also integrate with technology or any other manual technique such as sculpture or painting, as well as from a production perspective.

Civilization and the progress of peoples are linked to artistic printing, as it has appeared thousands of years ago and is considered one of the oldest arts practiced by humans and cave dwellers through blowing color or handprint cave stamps, which led ancient humans to be able to record their civilization through artistic printing. (Nageba Abd-Elhafeez Ali Abo-zeed El-wafi – Graphic Work Originality and Technical Development Through the Technical Edition-p.477-479-2023).

It is evident from this the extent of flexibility in the artistic edition, and that gelatin printing can contribute to artistic printing because the artist produces their artistic template themselves, which increases their passion and creativity in determining its size, shape, and thickness. Also, its ability to print all the details either by drawing on the template, applying printing textures, or through printing using laser-printed paper, leading to enriching the artistic print and maintaining its authenticity.

### 3.5 Practical experiment of the researcher

**Jelly tools plate**

1) 40 grams of gelatin
2) 50 grams of glycerin
3) 40 grams of boiled water
4) Microwave
5) Container
6) Silicone or aluminum mold
7) Applying a Retarder substace to slow down the drying of acrylic colors.

### 3.6 Steps to make a Gelatin mold

1) Mix the medical glycerin with gradually adding gelatin on top of it for at least six minutes to blend them together, then leave them without mixing for fifteen minutes.
2) Add 40 grams of water, which is the same as the gelatin standard, and the water must be boiled.
3) Heat these ingredients in high heat (microwave) for thirty seconds, then mix them together for six minutes, repeating this step four times.
4) At first, the artist will notice the separation process between the water and the materials used, but stirring should continue to recombine them again.
5) The materials are poured into the silicone mold, and its size and shape are determined by the artist according to his choice of silicone or aluminum mold.
6) Removing air bubbles using a squeegee by removing the surface layer of the material.
7) It is exposed to cold to dry for twenty-four hours.

8) After making sure it is dry, the artist removes the silicone mold, meaning that the gelatin mold is ready for the printing process.

**Figure no. (9) Print template tools during the preparation stages**

**Figure no. (10) The image shows Glycerine and Gelatin**.

**Figure no. (11) During the preparation of the Gelatin mold.**

**Figure no. (12) When the Gelatin mold comes out of the aluminum mold.**

**Figure no. (13) The image shows the Gelatin mold after it's prepared.**

### 3.7 Gelatin Printing Tools:

1) Flat plastic plate for spreading colors
2) Light acrylic color
3) Dark acrylic color
4) Printing tool (Cylindrical roll)
5) Printing texures
6) Gelatin plate
7) Paper

### 3.8 Methods of Gelatin printing:

1) Ink the plate with a dark acrylic color.
2) The artist places the textures he wants to print on the printing plate.
3) Place a sheet over the printing plate and print using traditional printing methods to remove excess ink and print the textures on the printing plate.
4) Remove the textures from the printing surface and note that the textures have been printed on the plate.
5) Ink the plate over the printed textures with a light acrylic color.
6) Place a sheet over the plate and print the artwork as a whole, and the artist will notice that the sheet has all the textures executed in dark ink and the background executed in light ink.

**Figure no. (14) During the gelatin printing stages**

**Figure no. (15) shows the Gelatin template printed above the printed textures**

**Figure no. (16) shows the Gelatin template with printed textures using a dark acrylic color**

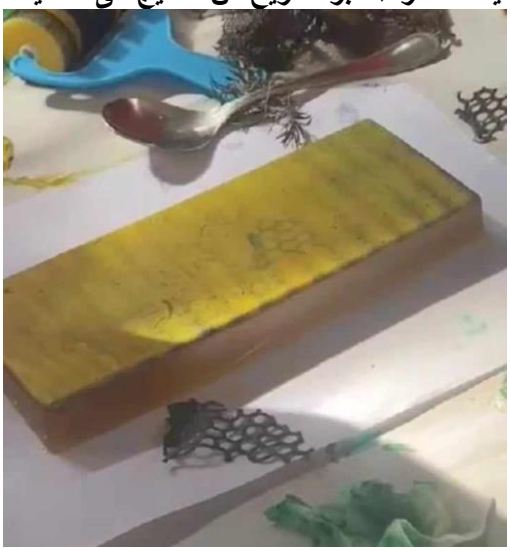

**Figure no. (17) Another form of the Gelatin template as it is inked into the second layer in light acrylic color**

**Figure no. (18) During the printing of the Gelatin plate in its final image with textures and background**

**Figure no. (19) shows the printing paper of the Gelatin**

**Figure no. (20) shows printing paper for Gelatin printing**

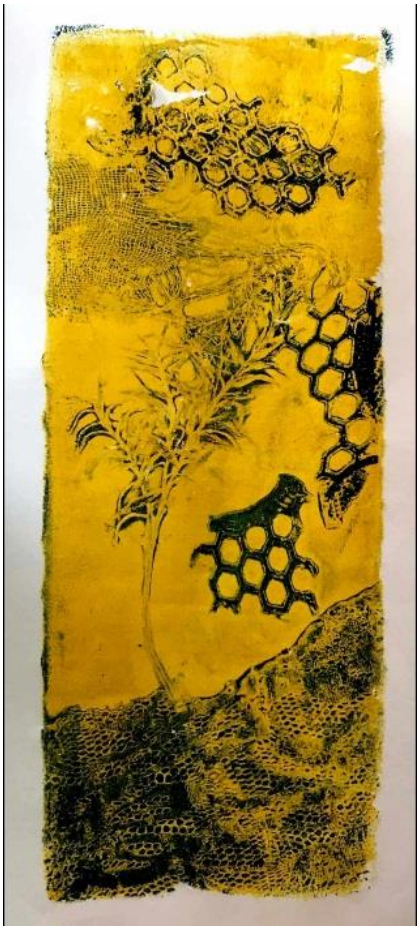

**Figure no. (21) shows printing paper for Gelatin printing**

# 4. Results and Discussion:

## 4.1 Search Results

1) Producing a printing template according to the artist's perspective in terms of its size and shape.

2) Enriching the artistic edition with various printing techniques.
3) Introducing graphic processors using modern software and integrating them with manual printing.
4) Gelatin printing can be combined with any other type of printing.
5) It is possible to create a printing template and pour it inside a mold with different shapes and textures, and print it using embossing (Intaglio) techniques manually.
6) The Gelatin printing plate can be engraved using Relief printing methods by applying pressure.
7) The Gelatin mold itself can serve as the artwork and the artist does not need to print it.
8) The Gelatin mold can be made as sculptures by pouring and shaping it in any mold the artist desires.
9) Sculptures can be made by pouring Gelatin into molds of various shapes, and once dried, they can be printed on using stamps. These molds serve as the artistic work.
10) Preserving the environment because the materials used in producing Gelatin molds and printing are environment friendly.
11) Promoting the idea of Recycling by using printed materials, damaged fabrics, and wilted plant leaves in beautiful artistic works.

### 4.2 Recommendations

1) Use of Gelatin printing in sculptural works.
2) Using AI software with Gelatin printing.
3) Integrating Gelatin printing with other types of printing such as Lenticular printing.
4) Converting Gelatin printing into three-dimensional by manually printing it using Cyan and Magenta, or through modern automated techniques.

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