

Technological and Aesthetic considerations for glass tapestries and their utilizes in interior design.

Dr. Walaa Hamed Mohamed Hamza

Lecturer, Department of Glass, faculty of Applied arts ,Helwan University

Walaa_glass@yahoo.com

The research summary:

A dot is considered one of the elements of design, it has a huge importance in building the form, color significance or meaning and concept. The dot as being one of the elements of plastic artistic work has a great role in showing the aesthetical value and its radiance in the glass artistic work created by melting granules, as each glass granule is considered a dot, so arranging and combining dots with what fit the prepared design.

As life and nature are considered a fertile field full of aesthetic values and vocabs that arouse creativity and enrich the self with successful experiences and solutions despite circumstances and across the time. It is considered a rich, beneficial and innovative source for whoever studies it. Also the process of linking its elements and imitating them with meditation and accuracy in the surrounding shapes and what they contain of various forms that influence the artist and his/her works. The inspiration was selected from the building compositions of crocheted, as aesthetics of touch and movements in strings and composition of crocheted and what opposes it from nature and aesthetics of colorful glass granules and the match between nature and texture of crocheted strings and ratio of spaces among them and their similarity with glass granules.

As a glass granule is considered the dot and structural compositions of crochet and determine the main line, an exhibition called Dot and Line was held through the inspiration from the structural compositions and their simulation with the glass material that is characterized by being a difficult material in formation but through melting granules technique, many designs have become achievable that simulate nature in texture, color and shape, it has become hard for human to differentiate between nature and material just by looking.

The research problem: Structural compositions in crochet have a huge effect on the superficial appearance of the textile regarding the form and aesthetics. How it could be benefited from characteristics of the variation of the building compositions in creating diverse glass applications that carry different artistic values and achieve sustainability more than the textile?

The research achieves its target through:

- Benefit from the structural compositions in crochet in creative artistic applications using pate de verre (glass melting) technique, also employment of the resulting designs in interior design to add diverse aesthetic values.
- Achieve the most important technological and aesthetic considerations of the various building structures executed through melting the glass granules.

The research significance relies in:

- Integration among various fields of applied arts such as glass, textile and interior design.
- Study the variable and different effects resulting from each building structure and possibility of using it in variable designs in interior design.
- Glass recycling and benefiting from it in producing sustainable products.

The research methodology

It follows the analytical, descriptive, and applied methodology.

Introduction:

The concept of inspiration means to focus on appearance and essence in order to create a new artistic creation, which is reconstruction and building of the essence of the form from the original resource, in order to create creative, genuine works as photos that reflect the original form, depending on establishment of a creative dialogue between the original and the copy, allowing space for innovation, creativity, communication and revealing facts.

Nature is considered the first teacher, inspirer and resource that humans are inspired from along the years to solve any problem, designer inspires symbols and elements mostly from nature and organizes those elements within the light of what nature possess from various and different elements as it has diversity, balance, harmony and similarity.

The exhibition philosophy and vision:

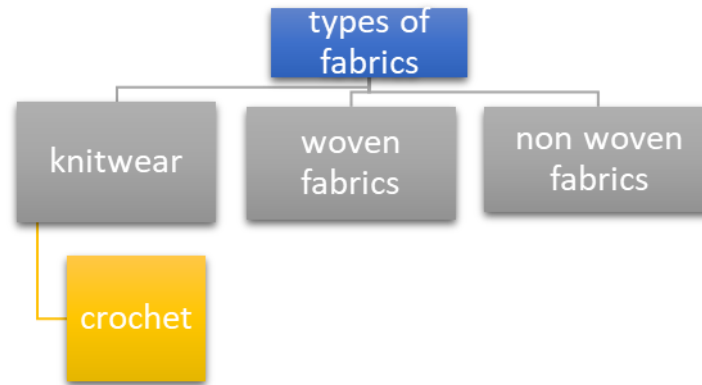
Structural compositions of crochet are known by being the way that the process of dovetailing and tangling of threads together to form a textile, as the methods of dovetailing, they produce diverse structural compositions that differ in their superficial appearance from each other and the texture resulting from each composition and from dovetailing of strings together with different degrees, which called for its simulation to glass material to achieve various artistic values from color fixation, feeling the texture and realization of transparency or darkness according to the will.

Target of the exhibition:

- How can we inspire from the structural compositions of crochet and its various lines in creating designs that fit as glass products that can be employed in interior design using pate de verre (glass melting) technique?
- Glass recycling and benefiting from it in producing sustainable products. Achieve infinite of superficial touch simulations of crochet, also number of simulation applications for the textile materials and what distinguish them.
- Achieve the most important technological and aesthetic considerations of the various building structures executed through melting the glass granules.

1- Types of fabrics:

Fabrics are of the most important products that humans deal with for his/her entire life and they vary among knitwear- woven fabrics and non-woven fabrics as in figure no.1.



1- Woven fabrics.

They consist of two groups of strings, the 1st group is the longitudinal and they are called wrap threads and the 2nd group is the transverse threads and they are called wefts (the 2 groups intersect according to geometrical system called histological structure, such structures vary according to the types of fabrics required to be produced.

2- Knitted Fabrics

They are consisted through converting the continuous thread into threaded tabs, specific needles are used for this purpose as they move through the tabs to build new ones in a consecutive way.

3- Non – woven fabrics

They are directly produced from hairs without passing through the stage of weaving, those hairs look like stretched mat, then cohesion and integration among the hairs to compose the fabric, this type is used in a wide range of medical and industrial purposes.

The research is concentrating on the 2nd type which is knitwear, as it is known as the process of formation of fabric from one thread or more than one in the form of tabs using knitting needles. Crochet is considered a type of knitwear, it is the process of forming a tissue of yarn or string using a curving needle called crochet needle, the word crochet is derived from the French word croc or croche, in Arabic it means hand stitching or hand textile with needle. Crochet is considered a handmade art, its sewing is through withdrawing the thread tabs through other tabs using one needle, reproducing a thick and more flexible fabric than the knitwear, figure no.2 clarifies the way of creating a piece of crochet.



Figure no.2 method for crochet production.

Constructive compositions are the methodology through which the process of tangling or dovetailing the threads together to form the woven fabric, as the methods of threads dovetailing vary, the different the produced constructive compositions, which differ from each other in their superficial appearance. Constructive compositions are the base of building the woven crochet that can build aesthetic values in the piece through threads dovetailing with various degrees.

2- Used tools to produce handmade crochet fabrics:

2-1- Needles:

They are of the most important tools that are used to produce crochet fabrics, there are too many types of needles which are made of stainless steel, aluminum or plastic, they are available in various sizes according to the piece required to be executed and according to the type of string, there is (double ends needle) which are double hook crochet needle, figure no.3 and it is used to introduce another color to the piece.



Figure no.3 forms of crochet needles.

2-2- Threads:

Types of the used threads vary in producing crochet fabrics, some are natural and others are industrial, some are cotton or wool, figure no.4, numbers of threads and their colors differ according to the use and cost, types of the thread affecting in the building form of the final piece.



Wool or winter thread

Cotton or summer threads

Figure no. 4 types of crochet threads.

2-3- Structural forms of crochet:

They vary according to the type of the stitch and the way of building the texture, some are simple, some are complicated, some made of one thread or more than one, types of stitches vary in forms such as column stitch, padding stitch, fan stitch, X stitch, popcorn stitch and shell stitch. Figure no.5

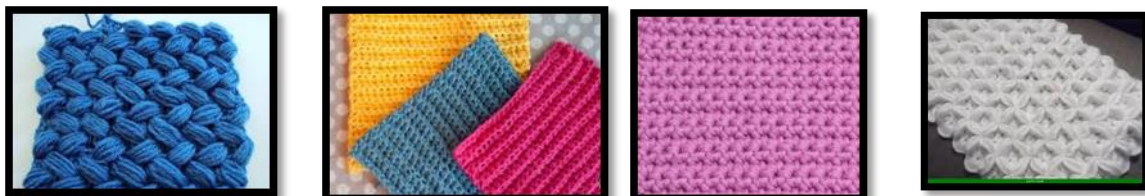


Figure 5. forms of crochet stitches.

3- Glass granules melting technique:

The process of glass formation by melting its granules is considered one of the old molding techniques and it is called pate de verre or formation through glass paste, this method is

characterized by creativity and it has no restriction, also the possibility of executing all forms whether flat or embodied, and achieving nature simulation in color, touch, transparency or opaqueness. Which makes it one of the unique and distinguished artistic methods with a special style.

4- Factors affecting the final shape of the glass:

4-1- Color: it is considered one of the strong and effective elements in designing artistic products formed by pate de verre. Understanding characteristics and effects of color is considered important in any design. Knowledge of principles and scientific basics for color choice is of the basics of the artistic work, through what colors can add of aesthetic effects in the glass product and what its psychological effects reflect on humans, scientific basics for color use should be studied and their functional, aesthetic and psychological effects in the artistic products formed by pate de verre and reflection of all that on human.

4-2- Touch: it represents one of the important factors in the process of creativity for the designer, through this element, through this factor, elements of design can be given the proper way of expressing its style, function or how it is structured, in addition to achieving aesthetic pleasure with materials and craft or industrial dazzling. Design with feel or touch acquires from the designer a good knowledge of the glass material, its characteristics, multiple forms and potentials to be used with what matches the required function.

It is the characteristic resulting from arrangement, organization and treatment of a substance or a medium. Touch or feel in glass is known as: the optical effect of the glass surface under the light, and what happens of interference among light, shadow and color shades. It is an important source of the sources of aesthetic energy of glass, also it is an important factor of the general formation factors of glass products, which is the distinguished feature of glass granules melting technique in particularly.

4-3- Glass type: as glass types differ, the final results of the product and its appearance are affected.

4-4- Glass transparency: use of transparent or opaque glass has an influence on the appearance and confirming perceptual sense of the product.




4-5- Relation between the glass material and temperature of formation: as type of glass, its shape and its size vary, the required temperature varies as well according to the required design, powder glass has different melting point than larger glass granules.




4-6- Glass color: through the difference among hot and cold colors and what they achieve of aesthetic values, also some hot colors go into crystallization inside the oven which affect their transparency in contrary to cold colors that normally don't change during burning.





5- Practical applications:

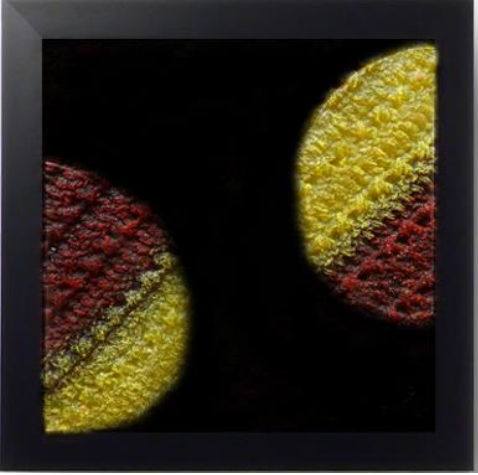



collection of crochet samples was chosen with various types of stitches with an area of 30×30 cm. of wool threads, some models with the same stitch were done, then the thermal mold was poured. The mold consists of (50% gypsum-50% silica) then the mold is left to dry completely, afterwards the glass is distributed on the mold according to the required design and colors, it is placed in the oven according to the thermal curve represented in table 1, then the mold comes out of the oven and glass is separated from the thermal mold and it is cleaned and prepared.



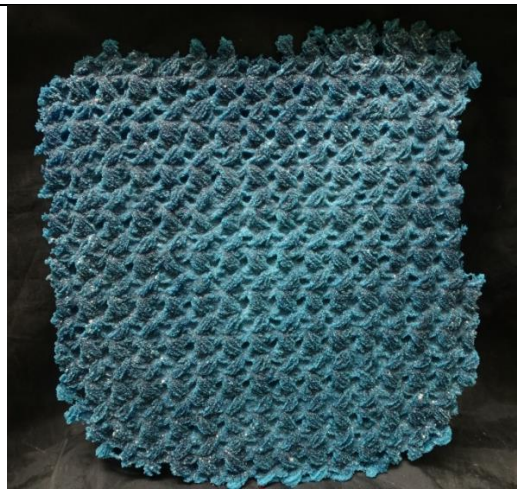

Temperature in Celsius degrees.	Time /hour	Steadiness /hour
٥٠٠	٥	
٨٠٠	٠,٠	٢
٥١٠	٠,٠	١
٤٨٠	٢	١
٣٨٠	٥	
٢٠٠	٦	
٢٠	٠,٠	






Model for analysis and description of the artistic works		
Model no.1		
The work name: Glass Tapestries (Granny square unit circular in the middle)		
		Structural composition.
		Shape of the refractory mold.
		Filling the mold with glass granules before burning.

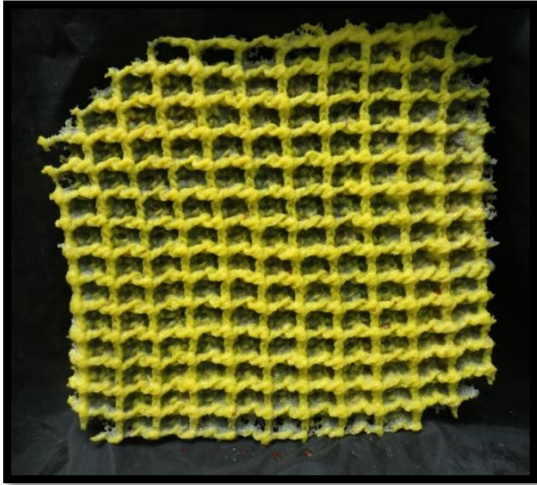


	<p>An image of the work.</p>
<p>Dimensions of the work : 30×30 cm.</p>	<p>Type of the artwork : embodied () flat (✓)</p>
<p>Glass</p>	<p>The material:</p>
<p>Inspiration from life resources such as fabrics represented in crochet which wasn't considered to be applied with other material, and simulating them with hard material such as glass which is characterized by being difficult in its formation but using technique of melting glass granules, designs that simulate nature in touch, color and shape were able to be achieved.</p>	<p>The art work philosophy:</p>
<p>Characteristics of the artwork</p>	
<p>Employment in artistic works that highlight the glass aesthetics such as wall hangings and mirrors frames with various crochet textures that could match types of curtains fabrics with the same texture.</p>	<p>The aim of the work:</p>
<p>Inspiration from structural compositions of crochet in producing sculptures that could be employed in interior design.</p>	<p>Art direction:</p>
<p>Formation through thermally melting glass granules.</p>	<p>The used technique:</p>
<div style="display: flex; justify-content: space-around;">   </div>	<p>Function:</p>
<p>Model/ thermal mold/ glass granules/cooling and melting oven/finishing tools.</p>	<p>The used tools:</p>

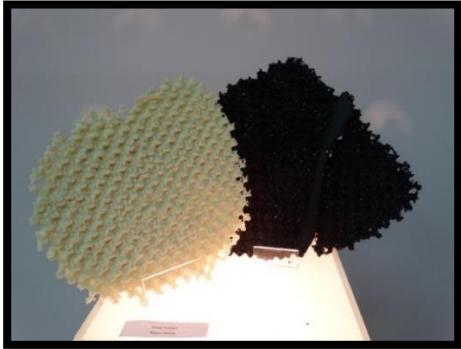

Model no.2	
Name of the work: lass Tapestries 2 (stitch ×line and line)	
	Structural composition
 	The mold before and after filling with glass granules and before burning.
	Image of the work:
Dimensions: ٣٠*٣٠ cm	Type of the artwork : embodied () flat (√)
Glass	The material:
Inspiration from different crochet stitches and their simulation with glass material to achieve various artistic values, regarding color fixation and diversity, touch of the texture and realization of transparency and opaqueness.	The artwork philosophy:
Characteristics of the artwork	
Employing it in art works that highlight aesthetics of glass with distinctive textures such as tableaus with various crochet textures, that	The aim of the work:



<p>could match types of sofa coverings with the same touch or employing it as vases with the same crochet texture that matches the interior design of the place.</p>	
<p>Inspiration from structural compositions of crochet in producing sculptures that could be employed in interior design.</p>	<p>Artistic direction:</p>
<p>Formation through thermally melting glass granules.</p>	<p>The used technique:</p>
<div style="display: flex; flex-direction: column; align-items: center;">   </div>	<p>Function:</p>
<p>Model no.3</p>	
<p>Work name: Glass Tapestries 3 (the curved buff stitch)</p>	
<div style="display: flex; justify-content: space-around;">   </div>	<p>Structural composition</p>

		<p>The mold before and after filling with glass granules and before burning.</p>
		<p>Image of the work:</p>
<p>Dimensions: ٣٠*٣٠ cm</p>	<p>Type of the artwork :embodied ()flat (√)</p>	
<p>Glass</p>		<p>The material:</p>
<p>Inspiration from different crochet stitches and their simulation with glass material and employ them as hangings in the interior space.</p>		<p>The artwork philosophy:</p>
<p>Formation through thermally melting glass granules.</p>		<p>The used technique:</p>
		<p>Function :</p>
<p>Model no.4</p>		
<p>Work name: Glass Tapestries 4 (the linear buff stitch)</p>		

	<p>Inspiration:</p>
	<p>The mold before and after filling with glass granules and before burning.</p>
	<p>Image of the work:</p>
<p>Dimensions of the art work 40*30 Type of the artwork :embodied ()flat (✓)</p>	
<p>Model no.5</p>	
<p>Work name: Glass Tapestries 5 (the Wrap stitch)</p>	
	<p>Structural composition</p>
	<p>The mold before and after filling with glass granules and before burning.</p>

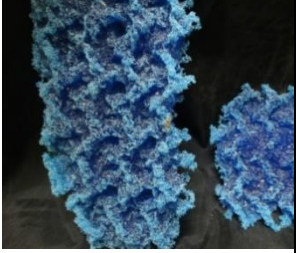

	<p>Image of the work:</p>
	<p>Work employment</p>
<p>Dimensions: ٣٠*٣٠ cm</p>	<p>Type of the art work :embodied ()flat (<input checked="" type="checkbox"/>)</p>
<p>Model no. 6</p>	
<p>Work name: Glass Tapestries 6 (the Macramé buff stitch)</p>	
	<p>Structural composition</p>

		<p>Image of the work:</p>
		<p>Dimensions of the artwork 40*30</p>
<p>Type of the artwork :embodied (<input checked="" type="checkbox"/>) flat</p>		

<p>Model no.7</p>		
<p>Work name: Glass Tapestries 7 (knitwear)</p>		
		<p>Image of the work:</p>
<p>Employing it as decorations on walls or as glass supplements.</p>	<p>Aim of the artwork</p>	
		<p>Inspiration:</p>
<p>Dimension of the artwork 50*10 cm</p>	<p>Type of the artwork :embodied flat (<input type="checkbox"/>)</p>	

6- Technological considerations in glass formation with its simulation to crochet

<ul style="list-style-type: none"> - Structural composition: of the first piece is circular shape (radiant) and that helped the mold with all its details equally while pouring the mold over the fabric. - Sculpting details: not deep which helped the ease of separating the model (the fabric) from the mold. -One of the most successful applications is (Granny stitch)in simulating the original with the same details, same direction of the stitches and same depth. 	
<ul style="list-style-type: none"> -Line by line stitch is from the successful structural compositions in taking all of the details. - The presence of inner spaces helped the interance of the mold mixture during the pouring among them which resulted in deep protrusions. - Use of two colors gave clarity and attraction for the structural composition. - Inner spaces caused the fabric to be inconsistent during its separation from the mold, which prevented the production of second piece on the same tapestries, due to the change in the details of the piece. 	
<p>Linear buff stitch; when using it with perpendicular structural composition helped the mold during the pouring to keep all the details in piece no.3, but in the other experience; the lines were longitudinal which led to the piece was slightly shredded during the pouring process and the stitch wasn't as clear as in the other experience.</p> <p>Lower temperature was used in this application, in order to feel the different touch of the same type of composition.</p>	
<ul style="list-style-type: none"> -The glass simulated the curved buff stitch in a high degree, as it has shown the details and the shape of the textile accurately in each stitch. - That stitch was distinguished with cohesive and strong structural composition than the others. - Control of degree of glass melting gave the sensation of the textile shape and its details. 	
<ul style="list-style-type: none"> -Walf stitch has various big sculpting forms, the researcher used 2 colors of glass, yellow layer in the prominent formations and grey layer in the sunken formations. -The glass simulated the fabric in high degree as well. - It was hard to separate the fabric from the mold easily due to the large sculpting formations. -It was preferred the use of transparent glass in this application more than the use of opaque glass to sense better sculpting values. 	

<p>-Zigzag stitch; the experiment clarified the shape of the structural form in a good way but the texture appeared to be rough (put into consideration to elevate the melting temperature more).</p> <p>-Use of transparent glass gave a better sensation of the sculpting formations.</p>	
<p>-In this experience, crochet threads (Macramé) were used, which are characterized with high thickness and hardness, such strings kept the cohesion of the mold during the pouring process and prevented its change.</p> <p>-In addition to removal of the piece of tapestries from the mold easily without changing its forms, which helped in performing successive pouring, and that's what the researcher did, 4 molds were poured on the same piece with different colors and the use of transparent glass and opaque glass each at a time.</p>	

7)Aesthetic values of glass formation by applying structural compositions of crochet.

- The use of more than one color realizes diverse aesthetic values comparing to the use of only one color.
- Color that has opaqueness gives a sensation of the mass and confirms the chosen artistic style as in the 4th and 5th applications.
- Use of protruded and sunken textures confirms the value of the work which appears in the 5th and 6th applications.
- Achieving balance through organizing relations of the work parts as whole from line, area, texture and color.
- Artwork with circular shape inspires infinity and continuity as in the 1st application.
- The works are distinguished with protruded and sunken sculpting which confirm the value of the work and make it stand out.
- Works varied from cold colors (blue and purple) and warm colors (yellow and red), warm colors are considered attractive and eye catching while cold colors give the sensation of quietness and peace.
- Some works gave the sensation of diversity through the use of rough or soft texture.
- Simulation of the crochet stitches with its sculpting details gave a strong sensation of the touch.
- The external form and the internal details highlighted the sensual and expressional values of the works.
- The works were distinguished with movement through the direction of the crochet stitches whether curved, vertical or horizontal.
- Choice of stitches with sculpting influences based on movement and construction values. This appears in the works domination and ability to express, also in how cohesive was the work and highlight of the movement to harmonize with the demands of the form.
- Arise the sense of the voided depth by distribution of dark and light areas.
- Achieve connectivity based on repetition of the stitches shapes and their diversity and degradation to create rhythm in the design.
- Texture makes light and shadow appear which increases the plastic value of the glass surface.

Table (3)

Measuring the surrounding circumstances of the exhibition and how far did it achieve its goals.			
Bad	Normal	Good	
		√	Lighting
		√	Ventilation
		√	Temperature
	√		Moisture
	√		Noise
		√	Area of the hall
		√	The way for arriving to the hall
	√		Number of visitors:
		√	Publicity for the exhibition:

Summary of the exhibition outputs since the start of the works' execution till the end of the show:

Negatives	Positives	Percentage of achievement	Outputs	Aims
Short time of the display as the exhibition only lasted for 5 days.	Participations and attendance from various sectors of students and professors of design in the faculty and whoever interested in art.	11 diverse applications	Various glass applications produced using glass granules thermally melting technique that simulate the compositions.	Inspiration of different structural compositions of crochet.
		Aims were achieved through the previously mentioned 11 applications.	Realization of infinite number of simulations textures for crochet, also many applications for simulation of textiles and what distinguish them.	Glass recycle and benefit from it in sustainable products.

		Aims were achieved through the previously mentioned 11 applications.	Through the beauty of the appearance and its brightness with controlling the required thickness according to the nature of the product and the ability to produce sizes and shapes flat and embodied.	Achieve the most important technological and aesthetic considerations for the various executed structural compositions through melting glass granules.
--	--	--	---	--

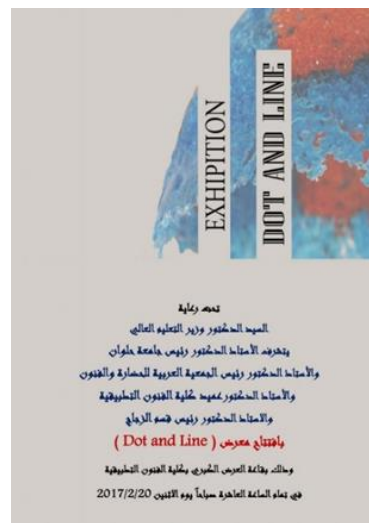
The most important results:

- 1- Achieve the most important technological considerations for each structural composition and execute it through the technique of melting glass granules.
- 2- Use of structural compositions of crochet in production of glass accessories, enriches their aesthetic values and realizes their sustainability, and it can be employed in interior design.
- 3- Glass recycle in creative design and technical trend.
- 4- Create production method in reformation of glass granules regarding molding, production and finishing.
- 5- Use of glass material with its color stability, textures and forms to achieve products carry the features of textile material with distinguished sustainability.
- 6- Collaboration among various fields of applied arts such as glass, textile and interior design contribute in creativity and innovation.

Recommendations:

- 1- The necessity of continuous cooperation among various fields of applied arts which helps to open up new horizons for creativity and innovation.
- 2- Study other types of fabrics and benefit from them in glass applications.

Some publicity for the exhibition:



Some photos of the exhibition during the opening and the show:**References:**

- 1- Amany Hamdy ,Shimaa Salama ,Alfan aleslamey kmsdar molhem leltakamol algamaly w alwazefy fi tasmemat almoalakat alhaeteia alnasgea w alzogagea ,moatamr aldawly althany lealhadara alarbia w alfnon aleslamia ,Loxor ,2016.
 - Amani Hamdy , Shimaa Salama “Islamic art as an inspiring source for aesthetic and functional integration in design of life textile and glass hangings” the 2nd international conference for the Arab civilization and Islamic arts” Luxor, 2016.
- 2- Rawia Ali Ali Abd elbaki,roaia mostakbalia ltatoir altreko kherfa yadawia litalbit ehtiakat almogtama almoaser, moatamr aldawly althany lealhadara alarbia w alfnon aleslamia ,2017.
 - Rawia Ali Ali Abd Elbaki “future vision for development of knitwear as a handicraft for supplying the contemporary society needs” the 2nd international conference for the Arab civilization and Islamic arts-2017.
- 3- Sanaa satea abbas, estrategia mohakat altabiaa w alshakl almemariy almostadam, derasaa taheleia e alshkal alodwia men khelal amal almemary Tsui Eguen ,bagdad.

- Sanaa Satea Abbas “strategies of nature simulation and sustainable architectural form” analytical study for organic shapes through works of the architect Tsui Eguen. Baghdad.
- 4- Mohamed Gamal Abd algafoor ,Ghada alsiad,fan alkhedaa albasiry w dorho fi tasmem almoalkat alwabria almostakhdama fi alemara aldakhilia mahdoda almesaha,kolit alfnon altatbekia Domiatt..
- Mohamed Gamal Abd Alghafoor ,Ghada Alsiaad “art of optical illusion and its role in design of hairy hangings used in interior architecture with limited space- faculty of applied arts- Damietta university.
- 5- Marwa Hessin Tawfeek, aledrak alhesy w athrwo fi wada maieer altasmeem aldakhly almolaim lebiat almakfofeen ,resalt doctora ,fnoon tatbeeia ,Helwan,2010.
- Marwa Hussain Tewfik “sensory perception and its effect in putting standards for interior design which are convenient for the environment of blind people” unpublished PhD thesis - faculty of applied arts- Helwan university-2010.
- 6- Mona Mahmoud Shams ,alawamel almoathera fi estetakit alshakl alkhzfi ,magsteer, fnoon tatbeeia ,Helwan 2004.
- Mona Mahmoud Shams “factors affecting statics of the ceramic form” unpublished master thesis - faculty of applied arts- Helwan university-2004.
- 7- Alice Lane Casting Pate De Verre Sculptures in Glass Kilns, article, Academic journals & books at Questia Online Library July 24, 2009.
- 8- Nanette Freeman The Origins of Pate De Verre Glass Making Techniques, Ezine Articles, August 28, 2010.