

**The effect of multiple thermoforming techniques on showing properties of  
(Color – transparency – texture) of glass”**

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**Abstract:**

Glass thermoforming techniques are one of the most important techniques in the field of glass production. They are based on the exposure of previously manufactured glass to high temperature, that is working on reforming it into a new shape in the form of a diversified product, which may be related to function or aesthetic use or the integration between them.

This research is related to the techniques of the thermoforming of glass in the field of uses with aesthetical nature, which in this trend is exposed to the constituents of the product form, emphasizing the function of color, transparency and texture elements in assuring the aesthetics of the product with each technique. The different methods of production in thermoforming techniques provide a variety of directions and constraints in the formation to meet the requirements of the design similarity to the product, represented in showing the elements of product construction.

Hence, the research problem was;

The lack of sufficient studies on the requirements for achieving the characteristics of color, transparency and texture in the thermally-formed glass, under the shadow of the diversity of the used technics and methods.

The main objective of the research is;

To develop a set of considerations that are affecting some of the forming elements to the appearance of glass products by studying the requirements of showing their properties in thermoforming techniques. And thus contribute to the service of different paths that are associated with the academic and practical studies of technology and its users, and hence came the hypothesis of the research;

The possibility of achieving range of technological considerations, to achieve the most important characteristics of the appearance of the shape (color – transparency – texture) in their relation with the diversity of production methods of thermoforming glass.

The research presented a set of main axis that tried to achieve the research objective;

Determining the scientific and artistic foundations of color, transparency and texture and their impact on thermally reforming glass.

The second axis of the research was to classify the main technical methods of glass thermoforming with the determination of their thermal levels.

The most important results of the research;

To develop important methods to achieve the characteristics of color, transparency and texture with each technique, In addition to the technical considerations of each element in relation to the variety of production methods of thermoforming glass. These considerations affect the development of a production system that transfers a lot of self-techniques in the implementation of thermoformed glass to scientific and technical systems that are easy to apply and can therefore be developed in design and production paths.

**Keywords:** Thermoforming of glass, formative Elements to form a product , Color, Transparency, Texture.