

## Design Trends of Glass Balusters According to Fixing Considerations

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### Introduction

Glass balusters have become an important architectural vocabulary for both interior and exterior architecture. It is now found in many architectural elements such as stairs, balconies, windows, corridors, etc., and due to the need to add new innovations in the field of glass balustrade in architecture, hence comes the importance and need to focus on it as one of the areas of glass design for architecture.

The research presents innovative glass units for the balusters and suggests some solutions to the problems facing the designer and the executor, so that this product comes out to the markets as expected and achieves the purposes for which it was made. There are many methods to produce these new glass balusters units, each of which has its considerations during production processes, including regards to glass itself, or for the type of molds used, or the dimensions of machines, including aesthetic aspects, and installation methods as well. This research is exposed to the requirements for installing the proposed baluster units and their production considerations that affect their design from the outset.

In this research, the installation of units in the stair was chosen as one of the architectural elements that require a lot of study to suit the types and methods of installation.

### Research problem: -

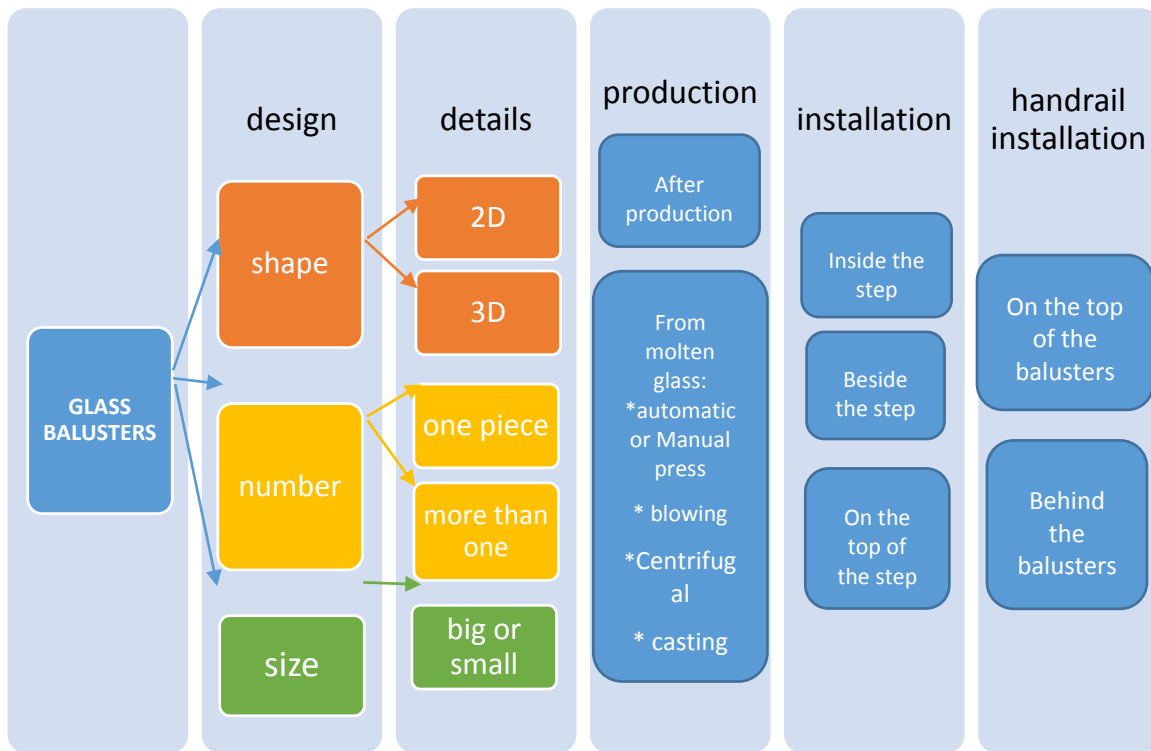
The difficulty of installing the proposed glass baluster units designs in traditional ways.

### Research objective: -

To identify the relationship between the methods of producing the proposed design trends of the glass handrail and the ways in which they are installed in place.

### The importance of research: -

Solve problems of installing quantity-producing glass baluster units to facilitate installation and show the most appropriate production and installation methods for each design trend, so that the task of installing them in the stairs becomes easier.



Component elements of the glass balusters

to reach the glass balusters, several elements had to be studied, as in the previous plan, the most important of which were:

**First: Glass balusters design: -**

When assigned to design a glass baluster, the designer must take into account the matters relating to the place, its size, its dimensions and the dominant artistic character (model) as well as the raw, the limits of dealing with it, its possibilities and the extent of its design and how to determine the appropriate technology for design, Installation systems, their properties and their suitability for design without the last and the brappers must be studied.

**Proposed trends: -**

The handrail is a large glass surface and in cases the handrail is a single area. (Currently commonly used).

The handrail is a separate flat unit, each of which is fixed separately in the floor and cupel. Case (1) of the innovative models in question.

The handrail is a structural structure that carries various pieces of glass and the structure is mounted on the floor and the cupoft. Case (2) of the innovative models in question

The handrail is a separate stereoscopic unit, each of which is fixed separately in the floor and the cupoft. Case (3) of the innovative models in question.

**Second: Production of innovative design trends for glass handrail: -**

Innovative designs are produced according to their shape in one of the following ways:

Post-production flat glass: -

Tempered Glass, a floating glass that is thermally strengthened to become stronger than flat glass, and it was possible to strengthen the glass from a thickness of 4mm to 20 mm to suit the requirements of use in addition to making aesthetic designs on the glass and then strengthen it

it afterwards (reference 3), its safety rate is high compared to ordinary flat glass (raw) (reference 4);

"Laminated glass multi-layer glass with two and three layers" is a glass consisting of two or more layers of glass between a layer of plastic material of PVB, ranging in thickness from 6 mm: 50 mm and can be produced from transparent glass that is not colored or colored, reflective glass or Low-E glass, and can also be made It is for one or two layers to increase its shock tolerance and safety.

From vitreous molten: - These methods are mostly used for stereoscopic units: -

1. Manual or automatic press.
2. Bloating.
3. Centrifuge.
4. Casting.

### Third: Glass handrail installation systems: -

The problem of installing handrail units is due to their different thickness due to the composition on their surface and the different fish from which they are fixed on the stairs. The relationship between handrail sandsystems and handrail design is considered to be reciprocal in the case of the construction aspects (tilt angles, width of degree, width of sleeper) imposed on the designer specific cases of installation, the designer must take into account this in the design to achieve the highest degree of security, safety and comfort, In the case of permitting in the structural aspects, the designer designs the handrail with the design of the optimal installation system for maximum security and comfort as well as aesthetic values.

The stabilization of units in the ground has cases: -

- A. Install the handrail inside the stair way floor.
- B. Installing the handrail next to the stair steps.
- C. Install the railing at the top of the stair.

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