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## COLOUR, FORM AND LIGHT FUN: ARTISTIC GLASS IN ARCHITECTURE

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### FORMA, KOLOR A ZABAWY ŚWIATŁEM CZYLI SZKŁO ARTYSTYCZNE W ARCHITEKTURZE

#### Abstract

Art glass has a privileged position in the architectural space. This is due to its basic property of transparency, and its close relationship with light as a factor which determines form, texture and colour. Therefore playing with architectural glass in architecture is related to the most fundamental matters. This article presents several issues related to the effect of art glass on the architectural space. Each of the façade glass examples has been made using a different technique.

*Keywords: art glass, glass façade*

#### Streszczenie

Użycie szkła artystycznego bywa pretekstem do różnorodnych gier i zabaw w przestrzeni architektonicznej. W artykule przytoczono kilka przykładów budowania przegrody szklanej przy zastosowaniu różnych technik monolitycznego szkła artystycznego. Każda z realizacji stanowi swoisty przykład możliwości estetycznych i kompozycyjnych szkła w powiązaniu z funkcją w przestrzeni.

*Słowa kluczowe: szkło artystyczne, fasada szklana*

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Fun is fundamental to the creative process. The pleasure that one takes in creation, the freedom and unpredictability of the result lead to freeing the creativity of the artist. When having fun, we are more willing to experiment and find it easier to tackle difficult tasks. We are more open to applying original solutions which we would normally feel were impracticable, and which could well prove to be the best solutions once the technical details have been fine-tuned. The way something was created always affects the final result. The creative phase is followed by the painstaking process of refining a project, but the object has at that point already acquired a specific lightness. Fun results in brave, surprising and inspiring architecture. The space that is created forces users to break away from clichés and draws them into the fun.

Art glass is only one architectural component, but in the architectural space it takes on the role of a ‘master of ceremonies’, leading the way in the play with light and special visual effects, and introducing colour and narration.

A transparent, semi-transparent or opaque partition – monochromatic or colour – influences the architectural space by adding more values to light. This phenomenon has an aesthetic and functional purpose. Art glass may be used to modify the physical and functional properties of light, it may regulate the access of light or filter light, partly reducing portions of its spectrum.

Depending on the pattern’s density, light opaque layers, provided in the form of a raster, remove excess and protect against excessive penetration of light and sunrays.

Coloured glass reduces parts of the spectrum, which may be used, for instance, to protect the building from overheating. By changing light colour, blue glass reduces the red and infrared fragments of the spectrum and protects rooms which are exposed to excessive sunlight penetration against overheating.

Monochromatic and colour light introduces a number of additional visual effects into a space. Depending on the technique and surface smoothness, these may include mirror reflections, multiplications created by overlapping multiple glass layers, as well as hot spots. This is further enhanced by additional elements resulting from sunrays penetrating the glass layer, namely monochromatic and colour shades. Relief glass produces even more effects.

## **1. Indoors – Outdoors – Ornaments**

Regardless of the form and techniques applied, the effect of an art glass partition on its surroundings is always significant. It depends on its location within a given space, the size of the glazing, the artistic effects applied, and lighting. Art glass façade effects can be seen on different levels: from urban development, through the nearby surroundings, to the buildings’ exterior and interior. Its presentation differs depending on the time of day and lighting. All monolithic art glass techniques<sup>1</sup> affect the external and internal space in a different way.

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<sup>1</sup> Monolithic art glass, as opposed to stained-glass, is a uniform layer, without divisions or connections made using lead sections. Several techniques of building monolithic artistic partitions have been developed, namely screen printing and digital printing, enamelled glass (manual application), laminated glass, glued glass, fusing, slumping or bent glass.

‘Entering a building is a crucial moment in the process of deciphering architecture’ [1, p. 243]. The perception, environment and light – all change. You see a glass partition in a new way. During the day the glass is seen from the outside ‘with light’<sup>2</sup>, and someone who is inside the building sees it ‘against light’<sup>3</sup>. This is very important as far as the design of the partition is concerned. The majority of materials and techniques used for glass partitions focus only on a single way of viewing. For instance, stained-glass is only meant to be viewed against light<sup>4</sup>. Monolithic art glass is usually developed using more than one technique, one of the reasons for this being the possibility of increasing the viewing range of a partition.

Glass viewed from the outside may seem completely different to what it looks like from the inside. Therefore the same partition may play different roles in shaping a building’s internal and external image, either contrasting or harmonising these images. The library building in Cottbus (Ill. 1) is an example of a great contrast between the elevation made of enamel glass and the character of the interior. The façade of the building, which is based on an irregular plan, has been completely covered with two layers of printed glass. A delicate veil of fine white raster produces an image of writing when seen from afar. The letter shapes are made of several overlapping alphabets. The resulting shapes fill the entire elevation. The printed layer eliminates mirror reflections as well as softening and unifying the glazing. A monochromatic ornament ‘changes’ depending on lighting and the distance from the façade. The printed white colour is seen from a long distance, and as you approach the building the shapes of the imprint composed of several layers become clearer. When seen from a few metres the building’s shapes become blurred and you only see ephemeral shapes of surfaces covered with fine white raster. The monochromatic elevation does not prepare the visitor for a colourful interior. Reading rooms found on several storeys are painted various shades of grey; whereas open storage areas as well as passages boast intense magenta, light green, white and black. The space on all storeys is connected with a vast round staircase. In a number of locations, information desks and leisure areas for visitors and readers can be found. The interior is colourful. The glazing is almost invisible from the inside, and provides a background for other colourful areas.

## 2. Light and shade

Another example of graphics on glass is Kendrew Quadrangle Café (Ill. 2) within St John’s College in Oxford, United Kingdom. The premises have a central location in the campus and due to this constitute one of its main components. They face the south and provide a view and direct exit into the courtyard. The design was created by Alexander Beleschenko, an artist living permanently in the UK. The glazing goes along the entire width of the premises. The glazing partition is made up of two layers covered with a screen printing pattern. The exterior layer is constituted by a mirror, while the interior layer is an imprint of white enamels. The pattern starts in the lower area of the glazing, at a height of 1.5 m, and increases its density as it goes up. From afar it looks like a composition of vertical elements spread irregularly on

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<sup>2</sup> Viewing glass ‘with light’ – the source of light is located on the same side of the glass partition as the viewer.

<sup>3</sup> Viewing glass ‘against light’ – the source of light is located on the other side of the partition.

<sup>4</sup> ‘Against light’ for an external partition means that during the day the viewer is inside the building. At night, when the interior is lit, the partition is seen from the outside of the building.



- III. 1. Herzog & de Meuron, Brandenburg Technical University Library, Cottbus, 2004
- III. 2. Alexander Beleschenko, Collage Café, St John's College, Oxford, 2011, <http://www.beleschenko.com/>
- III. 3. Martin Donlin, The Empire Theatre, Liverpool, 2002, <http://martindonlin.com/portfolio/the-empire-theatre-liverpool/>
- III. 4. Jaap Drupsteen, Netherlands Institute for Sound and Vision, Hilversum, 2006

a glass façade. When you stand a few metres away, you can see bits of the surroundings and passers-by reflected in the mirror paint.

The white and the mirror layer overlap, creating unique effects. While sunshine penetrates, portions of the mirror layer cast a shadow on the thin white paint layer, which provides additional values to the building. Vertical paint elements constitute a spatial curtain. The mirror layer, reflecting sunrays, protects the interior against excessive exposure to sunlight and overheating.

### 3. Colour and form

The wall of the back entrance into an extension built for the National Theatre in Liverpool (Ill. 3) in 2002 was covered with glazing designed by British artist Marina Donlin. This monumental abstract composition, which passes through three storeys, is composed of several flat interpenetrating forms of white, red and blue. The artist was inspired to play with this design by a theatre ticket found on the construction site during a visit. The design combines screen printing, manual enamel application techniques and sandblasting. The paint layer has varied transparency. The upper and lower areas are constituted by semi-transparent sandblasted surfaces. The middle part, made of screen printing and manually applied paint, is opaque. These varied transparency levels, combined with the variety of texture and colour, add life to the composition and emphasise its decorative function. The fact that the glazing faces north explains why the red colour was used. The glazing is located along the axis of a street at the back of the theatre. This free composition is in contrast to the brick walls in the yard. Inside the building, the view of the glazing is limited. It can only be fully appreciated in a small space between the exit and lift. Parts of it are seen from the mezzanine between the 1<sup>st</sup> and 2<sup>nd</sup> floors.

### 4. Narration and relief

Art glass designers and architects have been introducing figurative elements into façade compositions increasingly more often. One interesting example is the Netherlands Institute for Sound and Vision in Hilversum (Ill. 4). The building's functions are: museum, exhibition, office and archive. It was designed as a cube, half of which is underground, where car parks and the storage area of the archive are housed.

Almost the entire building is covered with glass panels made using the slumping technique<sup>5</sup> [6], the only exception being parts of the elevation located on the ground floor, where a strip of transparent glazing can be found. The glazing has been put in a section of the northern and southern façade, and along the width of eastern façade. In the office area in the western part, panels including art glass are combined with transparent float panes.

The elevation was originally designed as a colourful layer covering the entire façade. The design was prepared in cooperation with graphic designer Jaap Drupsteen. The façade glass is a combination of slumping and colour enamels. 750 scenes from the institute's archive have been impressed in the façade glass. Usually, a single scene is put on two adjacent rectangular sheets.

Coated relief glass have been made using innovative solutions which combine thermal fixing of enamel and shaping glass in a single instance of firing. A colour layer, prepared digitally beforehand, was first put on glass in a specially developed printing machine. At the same time, matrices engraved in an MDF board were created. The boards were impressed in an aluminium oxide layer, with which the furnace bottom was lined. On the relief impressed in the floor, glass panels were laid, covered with colour pigments, and burnt at 800°C.

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<sup>5</sup> Slumping – a glass treatment technique the aim of which is to make a relief out of a flat pane. This technique uses loose or solid forms. It is applied for small glass forms as well as large projects.

The colour layer, which covers the façade, is seen in the museum space in only a few places. A large area of it has been exposed in the finial of the multipurpose space located right behind the main entrance into the building. This space is spread between the office part, located on the western side of the building, and the museum part on the eastern side. The interior of the hall is painted in light colours, combined with orange. The background for the multi-coloured glass and orange seat elements and underground interior is provided by light grey stone floors and white plastic linings on walls. Glass constitutes an important decorative element of the interior. The multi-coloured transparent layer is reflected in the adjacent glass wall, optically increasing the glazing and magnifying the effect. Colourful reflexes are also dispersed by the white plastic lining which covers the museum area wall descending by steps. An important interior element is the glass wall going through all the storeys, on which faces of media personalities have been placed, made using black and white screen printing.

The above examples show only some of the aesthetic and functional possibilities provided by monolithic composition glass. They may be used to analyse some of the issues related to the essence of and the reasons for using an art glass partition in a building façade. Looking at the use of art glass as fun is fully justified, as most of the referenced designs are about fun. Creating an alphabet for a non-existent language and covering an entire building with such writing; playing with geometric mirror planes; creating large abstract compositions inspired by an accidentally found theatre ticket; or impressing important events from Dutch television and cinema in glass as a relief are enough evidence to conclude that art glass may be a starting point for having good fun during the creative process, but also the architecture resulting from such process may provide fun.

## References

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