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The Decade of the Façade Engineer

**THE BIG
INTERVIEW:**
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glass media facades



The digital Mediawall

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The architect Mr. Gabriel Allende had very special specification demands for the new image of the largest Imaginarium's establishment in the centre of Madrid. Imaginarium is the store of toys, with more than 400 shops all over the world. It was a challenge for the technical team of International EMC and its major corporate partners to work in close collaboration with the architect and his design team, to create this fabulous innovative entrance to the famous toy store.

Imaginarium is a company that cares very much about the external image at the front of their stores. The company's main clients are children up to the age of 12, each store has two entrances; a standard sized one for the parents and another just beside which is a half-arch of 1.50 meters so the children can walk in through their own personal entrance.

The architect Gabriel Allende, wanted a completely new glass façade, not just a beautiful transparent structure but one that

included high performance screens with high quality video projection capability.

We had to demolish the old existing structure and build a facade to a height of 6,5 meters. We could not use metal vertical structures; it had to be a completely transparent glass element.

Case study The Imaginarium, Madrid

For the Video display system, we studied several possibilities that exist today in the

market such as video projectors behind the glass. This possibility was ruled out due to poor quality of the projection during the daytime. A metallic mesh with LEDs works very well for large front facade surfaces on big distances, but have a poor aesthetic once installed behind an exclusive glass façade entrance.

After evaluating the various alternatives with all parties concerned, we found the ideal solution was to introduce the LED's directly into the glass façade.

A solution of constructing the LED's into the double glazing was not acceptable because of the problem of transparency. The joint between the glasses, because of the sealing of the spacer would interrupt the screen and this joint and its interruption was certainly not acceptable.

The final solution that was developed was laminated glass with LEDs

The design solution with LED's in low iron laminated glass was a tremendously difficult process. The demand for video projection, involved a technical solution in the type of LED and more important to resolve that each LED receives an independent signal, in the same

way as an LED screen for television and / or a computer screen.

Each LED has to be connected to a chip that receives the signal and transforms it into particles of light with the right colour to create a perfect video presentation.

Together with a leader in LED technology and computing we developed all the LEDs and the necessary installation equipment. It was critically important for the dimensions of the LED and the stability and quality of the colours and the availability to be able to regulate the lumen capacity for 24 hours a day with a light sensor. This would lead to economical use of the projection as needed.

Once the LEDs were clarified then we had to solve the most important part: how do we introduce the LEDs in-between the laminated glass and how to connect each LED independently and what distance would be possible.

The last question was clear to all parties in order to make video projection; the distance should not be greater than 30 mm between the LEDs.





We consulted all LED display manufacturers and the leading manufacturers of glass for the best technical solution in laminated glass. The conclusion was very clear, there was no solution. There are metal transparent coatings like the low E coatings which can be laminated and can connect LEDs. This could be an ideal solution but with this coating the minimum distance between the LED's is 100 mm and also it is not possible for a video projection only with design solutions or to move an image just in one colour or in three colours, but never projection of videos.

It was then clear that we needed a completely new technological development and could not use existing technologies.

The solution was a great success! Introducing a new technology to produce a completely transparent digital media wall in laminated glass, together with an installation and player software.

The glass dimension chosen for the project was for the LEDs: 1500 x 2000 mm. In one Glass Unit we introduced a total of 3300 LEDs. The distance between the glasses is designed to avoid interrupting the distance between the LEDs. The main facade has an area of 55 square meters. The LED screen is in the second row of glass: its dimensions are 12 x 2 meters, forming a unique display of 24 m₂ with a total of 26,400 LEDs.

In the first moment it was clear that the supporting structure should be designed in low iron glass, this transparent material meant it was possible to avoid any shadow marks behind the LED screen.

In collaboration with MEGA engineering, one of our company group members, we have calculated the whole structure of the glass fins with MEPLA program and so we could optimize the structure. The glass chosen was a laminated 10.8 with 4 PvB 1,52 mm and Heat Soak Test and for the glass fins a triple laminated and tempered glass with each 4 PvB 10/10/10 and also with heat soak test. The glass fins are of 6,500 mm long, forcing us to produce them in a special furnace, taking into account that most tempering furnaces have a length of 6 meters.

All Glass panes are of an exceptional Low Iron quality, absolutely necessary for optimal transparency for the video projection.

It was clear that we did not want a structural seal between the glass and the glass fins, but a connection with very high security. We designed anchors out of stainless steel with special disks which were sealed to the inside of the laminated Glass and connected to the glass fins. As a second secure connection between the glass and the fins a special structural tape with a thickness of only 2mm was applied. The outer joint between the glass was sealed with structural silicone in grey.

Final results

The installation team of our company had also played a very important part; it was the first installation of this kind and had a very high risk of breakage. This is because the media façade was made from glass with a value which bears no relation to normal glasses. The installation had to be done at night and in only three days all with special logistic plan. We used the most advanced mini crane, in order to make small movements necessary to install the glass panes and fins. In total more than 600 connectors to the LED connections and 1200 meter optical cables were installed. A special central power supplier with a PC was connected as the final peace.

The result was exceptional, there were no breakages, all the 24,000 LED's were operating right from the start without any problem. On the day of delivery, the company Imaginarium received training and several videos were already designed.

The clear view from the inside is exceptional. On the second floor of the store you can see right through the facade and into the daylight also which makes this product unique.

The high quality of the screen is a great success; we only use 20% of the led capacity which means a great savings in the use of energy.

Future developments

In this moment there is a lot of interest in this new product

BI-Visoen_ digital media wall

The product was patented last year.

At the present time we are looking at a spectacular new Project in the centre of Madrid, so no doubt you will read about this in IGS later in the year.

We are convinced that this product will change the street designs for shop fronts and glass façades in the coming 10 years. Every company can change his marketing presentation in one second all over the world by internet connection.

We offer together with our partners a complete solution for a digital Mediawall façade including, architecture, engineering, product and software service together with the installation anywhere in the world.

