

# Essilor, Paris, France

Barco supports Essilor in furthering its R&D processes

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Benjamin Rousseau, R&D Manager  
at Essilor



Innovation is the hallmark of Essilor’s activities. To keep developing lenses in line with today’s changing customer needs and new insights into the functioning of the human eye, the global market leader in ophthalmic lenses devotes 5% of its turnover to R&D.

Since 1997, the R&D department has been relying on Virtual Reality to support its product development processes. When the existing cubic no longer met today’s needs, Barco installed a Personal Immersive Environment (PIE) that combines a curved with a cubic shape. The solution guarantees great immersion, thereby helping Essilor enhance its R&D processes, to achieve its unremitting ambition of ‘seeing the world better’.

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Essilor was set up in Paris in 1972 after the merger of Essel and Silor, the two leading companies in the French optical eyewear market at that time. Since then, the Group has steadily grown into a world-class player in ophthalmic optics with operations in over 100 countries. The key to its success: more than 500 expert researchers around the world. At the Paris Bastille R&D center, Barco set up an exceptionally advanced virtual visualization system to explore and fine-tune new optical solutions.

The task of a lens is straightforward, yet very complex: provide an optical correction to ensure the wearers can see everything, despite their visual disorders. Lens design is a complicated process that must meet many criteria – from geometric and ergonomic through to physiological optics, psycho-physical, etc. Each lens requires around three years of design. To speed up that process and cut R&D costs, without compromising on quality, Essilor is relying on Virtual Reality.

### Pioneering R&D

“Our first virtual visualization system was a first in the industry back in 1997,” said Benjamin Rousseau, R&D Manager at Essilor. “The cubic, equipped with in-house developed modeling software, did a great job for over ten years. Yet, the screen was small, the image quality and resolution low and the system had become difficult to maintain. In a nutshell, it was outdated.”

Based on its experiences, Essilor bundled the requirements of the new visualization solution in a tender.

“We wanted an active stereoscopic system and the image to be projected had to be at no more than one meter from the test person,” Rousseau explained. “In addition, the solution had to ensure a 200-degree horizontal field of view and the user had to be able to stand upright. Last but not least, the system had to be compact as the R&D room is pretty small.”

### A true partner

Barco proposed a unique and innovative Virtual Reality environment and set up elaborate tests, studies and proof of concept demos to arrive at the final PIE design. The solution would be combined with Virtools software for high-resolution 3D computer graphics (a Dassault Systems’ solution). “What followed was a highly challenging project, as the concept was new to both Barco and Essilor and it implied unique projection set-up equipment as well as specially adapted software and hardware,” Rousseau recalled. “But the cooperation was great. Barco was a real partner that had both the technical competence and the experience to steer such a complex project to a successful outcome.”

### Cross between cube and sphere

Since July 2009, Essilor’s R&D room in Paris has been featuring the Barco PIE: a compact (7x3m and 2.7m high) cross between a cube and a sphere. Six Barco DLP Galaxy NH-12 stereoscopic projectors – coupled to Virtools software – create the illusion of being in a virtual environment. The projectors can boast a light output of 12,000 lumens and an extremely high

(1080p) HD resolution. Rousseau: “The total concept of the PIE is very unforgiving for any aberration in the image quality. The user is so close to the screen and the resolution so high that any anomaly will immediately spoil the immersive experience. Barco therefore used its unique Superflat Mirrors and Dark Acrylic Screens to match/complement the projector quality. High contrast screens that improve the normal contrast at least threefold resolve the problem that the contrast in a curved rear projected environment is typically too low.”

### Bright, uniform and durable

The Galaxy NH-12 projectors are designed for multi-channel operation, with built-in features like Optical Edge Blending, DynaColor, Linked Constant Light Output (CLO) and Warping (geometry correction) that guarantee one seamless composite image free of color, light or geometry disturbances. The fully-sealed, liquid-cooled optical engine prevents dust from entering the projector’s interior, eliminates routine maintenance procedures and greatly reduces potential system downtime, thereby ensuring a long, trouble-free system life time.

### Develop faster and more cost-effectively

The new virtual visualization system helps Essilor’s R&D team explore new optical solutions that can be tested directly on wearers. The PIE makes it possible to study design properties of new lenses and immediately gauge their impact on wearer feelings during the prototype research phase. In addition, it is extensively used for demos. “Ten years ago, we were a pioneer by introducing simulation. With this innovative solution, we are once again setting the pace. It helps us develop faster and more cost-effectively and as it is great to work with, it boosts our people’s work satisfaction,” Rousseau concluded. “Barco’s PIE provides true added value to our lab of innovation. In this way, it supports us in achieving our mission of ‘seeing the world better.’”

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