

CRYSTAL HOUSES, AMSTERDAM

Poesia hand-cast glass bricks reimagine the future of glass construction at Crystal Houses



Six years young and still going strong. Crystal Houses is the flagship store to Hermes, formerly Chanel, combining Dutch heritage with international architecture on PC Hooftstraat, Amsterdam's luxury brand street.

But it's more than just a flagship store.

It was a ground-breaking project, a world-first, based on months of research and testing, to create a unique, solid cast glass brick façade that's completely transparent, right down to the mortar.

The design genius of Winy Maas, architect and co-founder of MVRDV, and his team, and driven by developer Warenaar's desire for something unique, Crystal Houses is bespoke engineering at its best.

"We said to our client, 'Let's bring back what will be demolished but develop it further,'" explains Winy.

Clear glass bricks stretch almost the entire height of the façade—mimicking the building's original design, down to the layering of the glass bricks and the window frames—eventually disappearing into terracotta bricks, which house apartments that seemingly float above it.

Three existing buildings were demolished before the glass brick walls were meticulously constructed. The architects worked with university professors from Delft University of Technology, who led the design research and installation, as well as consultant engineers from ABT and Poesia Glass Studio who handmade each individually cast glass brick.

MVRDV had built a number of glass buildings before, though never of this complexity and none completely transparent.



“This project became a passion for many people to create and realise this vision of a ground-breaking project, which today has never been replicated. You have to be bold to want to take the project on in this installation methodology. The university professors who were involved in, and headed up, the design research are architectural lecturers with masters degrees, and there was an intensity and extreme focus in their research in cast glass as a medium,” comments Pietro Guarino, Director, Poesia Glass Studio.

A focus that paid dividends.

Through months of research, testing and steep learning curves, the team found a way of creating a glass brick on a glass brick bond that's completely transparent.

Poesia took care of the glass production brick by brick

Poesia was involved in the process early on. Working with the architects and the university, the size of the brick was determined by the visual aesthetic (a typical Dutch size) and the thickness by an engineering study, which determined how thick the brick needed to be for stability, bond strength and durability.

After mock ups were completed and approved, a period of intense glass brick production followed, individually hand casting each glass brick. This involved accurate polishing and measuring with calibrated laser machines, specially designed by the university. Every glass brick was post cut and CNC polished, then every face was hand polished to restore clarity (polishing makes it opaque). It was a four-stage process to cast glass brick perfection, and every single one was size checked in the factory before shipping. On arrival in the Netherlands the bricks were transported to the building site, then recalibrated and graded for installation.

The glass brick installation was slow, but meticulously accurate

The intensity of the design research phase moved to next level when it came to installation. Crystal House is more than a glass brick wall, it's a highly complex and well-considered design. Buttress walls come off the back, retaining the facade in a perpendicular plane and acting as the supporting structure. There are window frame sections and lintels, which were prefabricated and lowered on site because the glass bricks for the lintels were in a vertical plane, while those for the remainder of the facade were laid in a horizontal plane in a brick bond formation.

“Due to the sensitivity of the materials, an extremely high level of accuracy and craftsmanship was required and a technical development team was onsite throughout the process,” Winy reflects.

In fact, the two university professors moved in to the apartment above so they could be on site, every day. The installation team was kept small, given the level of accuracy and checking required.

“You can't put one foot wrong during the installation ... you can't build up three metres and deal with an error that's two metres lower. You have to deal with any error course by course, but it's worth the effort because it creates such a unique cast glass facade,” says Pietro.



waste materials (from imperfect bricks) were melted down, remoulded or completely re-purposed.

As Winy says, “Crystal Houses make space for a remarkable flagship store, respect the structure of the surroundings and bring a poetic innovation in glass construction. It enables global brands to combine the overwhelming desire of transparency with a couleur locale and modernity with heritage. It can thus be applied everywhere in our historic centres.”

The evolution of Crystal Houses, from Chanel to Hermès

The appearance of the façade has changed since Chanel was the first tenant, which has nothing to do with the glass façade or its UV stability (glass is a completely UV stable product). It's due to changes to the interior architecture and the resulting refraction of light.

Cast glass is inherently characterised by fine lines and small bubbles. “That’s one of the beauties of designing cast glass projects, it gives it that kind of living interest and character, capturing a brilliance that’s so unique, it’s a very artisanal product. It’s not designed to look like float glass, which is very flat and perfect,” explains Pietro.

When Chanel was in residence, the interior wall was bright, light and neutral. The glass bricks have a brilliant clarity to them with their highly polished texture, so there’s a metallic type surface to it, caused by the light refraction from the interior wall balancing into the highly polished glass.

Being a world-first, the team developed new structural solutions and fabrication techniques: The entire glass brick structure sits on a stainless steel base that was levelled by the university to a perfect zero. A high-strength, UV-bonded, transparent adhesive from German-based Delo Industrial Adhesives enabled the glass bricks to be laid without traditional mortar, maximising transparency. High-tech lasers and laboratory grade UV-lamps were also used, as was Dutch full-fat milk providing a reflective surface for leveling the first layer of bricks, given its low transparency.

The beauty and benefit of cast glass goes deeper than aesthetics

Never underestimate the strength of a full glass façade, despite its delicate look. Its innovative construction is stronger than concrete; strength tests by the university proving, for instance, that the full glass architrave can withstand a force equivalent to two full sized SUVs.

There is also minimal waste because all glass components are completely recyclable. Any



When Hermès moved in, some of the glass façade developed green tones, due to changes to the interior architecture (including construction of a dark tiled wall, and dark wood detailing) and the resultant reflectivity and light refraction from that, which has changed the façade appearance.

But both equally beautiful and unique in their own right.

There is no doubt the design of Crystal Houses was a starting point for reimagining the future of glass in construction, enabling cityscapes and urban experiences previously unattainable. But to this day, the likes of Crystal Houses has never been replicated, with its unparalleled level of accuracy and beautiful detail thanks to precision techniques rarely seen on construction sites.

Hard work, passion and persistence obviously pays. Since completion, Crystal Houses won 16 out of 18 awards it was nominated for, and Poesia still receives inquiries about it to this day.

Robertson's Building Products is excited to be the exclusive Australian distributor for Poesia glass bricks, and we look forward to introducing you to more projects, both in Australia and internationally, over the coming months.

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Developer: Warenar
Architect: MVRDV
Product: Poesia handmade smooth cast glass bricks, clear
Engineer: ABT
Builder: Wessels Zeist
Photographer: Daria Scagliola+Stijn Brakkee