

Heart of glass...

No home would be complete without windows. But with more architects opting to embrace the structural qualities of glass in their designs, glazing is being placed firmly at the heart of modern home building.





Occupying a remote coastal site overlooking Cardigan Bay, Cefn Castell makes use of structural glazing to bring the outside in. Structural frameless balustrading provides the property with seamless views. The spectacular three-bedroom cliff-side home featured in Channel 4's Grand designs and could be named as Wales' Best Built home. Wind and airtightness were very important as the property was very exposed.

So what is structural glazing? In short it's where glass becomes an intrinsic part of the structure, where its load-bearing capabilities are as, if not more, important than its' aesthetic appeal.

Kristian Hansen, of structural glazing specialists Clear Living, said: "Structural glazing allows us to do fantastic things with glass.

"In traditional glazing it is the frame which provides the strength, be it oak, timber or aluminium.

"But by utilising the structural qualities of the glass as a load-bearing medium, we can do away with frames and edges and create these aesthetically amazing living spaces of seamless glass which connect directly with the building, becoming an intrinsic part of the design.

"The only place there may be a frame is around the edges, but the trick is to incorporate that into the building design so it's buried within the structure."

Structural glazing generally uses an annealed soda-lime glass, which has a slight green/blue tint due to the presence of iron in the mix. The iron content can be removed to make the glass ultra-clear.



The glass is toughened by reheating it and laminated for extra safety and security, while special coatings help to eliminate solar gain.

During installation the glass is bonded to a frame using structural grade silicon, which has the capacity to secure huge weight loads while keeping the same waterproofing and movement qualities as normal silicon.

In terms of thermal qualities, the μ values of structural panels are superior to traditional framing systems.

Such is the popularity of structural glazing that almost all of the properties in the running for the 2015 RIBA House of the Year featured it in some way.

Kristian's firm Clear Living, based in Wincham, Cheshire, were brought in by architects to provide bespoke frameless glass frontage and minimal windows for two properties on the RIBA long-list, one in Formby, Liverpool, and another in Criccieth, Gwynedd.

Kristian said: "For the property in Formby we were asked to provide minimal sliding doors which we managed using our Sky-Frame system. This gives a frameless appearance, with only 20mm sightline between the glass panels. Structural glazing on the front elevation gave a smooth flush appearance.

"The property in Gwynedd was incredibly exposed, so wind and airtightness were very important. Structural glazing was used extensively to provide large 3000mm x 3000mm fixed panels. Minimal sliding doors were used with our Sky-Frame system. Structural frameless glass balustrading provided seamless views from the first floor bedroom towards the Irish sea."

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That’s why it’s typically used at the rear of a property, where people put their kitchen, dining and living spaces - areas where the views out are the best and the whole experience of connecting the inside with the outside becomes more meaningful.

Kristian adds: “It’s a feeling people tried to emulate with bi-fold doors. They look good when they are open but we have to remember we live in the UK.

“It makes more sense to design a building which works for 365 days of the year rather than one which is great for the seven days you can actually have your bi-folds open.

“Structural glazing is useful for front elevations if someone wants to create a feature entrance, a statement hallway or something like a double-storey atrium at the front of the house.”

So you’ve decided that it’s for you. What next?

Kristian advises: “It’s not something self-builders should begin to think about tackling themselves.

“It needs to be designed into the building before it even comes out of the ground. We work to tolerances of 2mm while a whole project might work to a tolerance of 10mm so it’s very important to make sure a specialist is brought in early on in the design process.

“You have to understand glass. You need to know where it can be strong and where it can’t take too much of a load.



The two-storey home is surrounded by mature woodland. (Right) Light floods in to one of the RIBA shortlisted properties glazed by Clear Living.



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“You also have to build in contingencies for glass failure. Working with an expert they will design in residual strength so the building stays intact while any repair is carried out.

“It’s very difficult to retro-fit or integrate into a project which has already started. 99.9% of the projects we work on are new-builds, re-builds or extensions.”

And the cost for all of this? Typically structural glazing will cost around 25% more than a high-end framed solution. But as with everything, this will vary depending on the size and the exact details of the structure.

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