i-build i-nterior i-scape

COVER STORY:

A different perspective

Prestigious homes demonstrate stunning use of structural glazing



NO COMPROMISE ON QUALITY Don't let your budget restrict your desire

for an authentic-

looking floor



EFFICIENT HOME FOR THE FUTURE A pitch on Passivhaus inspires a couple's new retirement property



SECURE YOUR DREAM HOME

Top tips on how to protect your build from unwelcome guests

IN THIS ISSUE: • SELF-BUILDS • RENOVATIONS • EXTENSIONS • CONVERSIONS

Lighten the load

this article, structural glazing specialist Clear Living reflects on inherent properties of structural glazing and reveals why it has become so popular in self-build and custom-build homes.

ince primordial times, glass has been around in one form or another. Natural glass, obsidian, was formed in the heart of volcanoes until it was discovered by Stoneage man and used to tip his spears. Bronze-age man, with his blast furnaces developed crude manufacturing processes for ornaments and

Clear Living worked with Liverpool architects shedkm

i-build



ingots. And the Romans, who are thought to have first mastered the art of glass manufacture, created the earliest windows in around 100BC.

Throughout time, glass has protected us, adorned us, served us and sheltered us, but until relatively recently it wasn't considered for its structural properties.

Always glass sat firmly in the domain of cladding or 🔶

i-build





curtain wall, whereas structure was all about steel.

Now though, the design world has woken up to the qualities of glass as a structural material, extending the palette of the architect and enhancing residential builds in ways never before seen.

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 specialist 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. This is called low iron glass.

Carrying the load

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 U values of structural panels are superior to traditional framing systems.

As Kristian says: "The reasoning for this is that the centre of the glass has the best insulation while the minimum is by the frame joints. By avoiding any frame joint we can provide the maximum overall U value to the installation."

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



Above: Structural frameless glass balustrading provided seamless views

Right: Structural glazing was used extensively to provide large 3000 x 3000mm fixed panels.

Above left: The U values of structural panels are superior to traditional framing systems

Left: The two-story home is surrounded by mature woodland

glazing was used extensively to provide large 3000 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."

One of the great appeals of structural glazing is that it gives the feeling of bringing the outdoors inside, and creating a connection which hasn't been possible until now. 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, where you're not overlooked by neighbours and the whole experience of connecting the inside with the outside becomes more

meaningful.

Kristian adds: "It's a feeling people tried to emulate "It makes more sense to design a building which works "Structural glazing is useful for front elevations

with bi-fold doors. They look good when they are open but we have to remember we live in the UK. for 365 days of the year rather than one which is great for the seven days you can actually have your bi-folds open. 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's not a traditional window where you measure the opening. 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.

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.

www.clear-living.co.uk

Above: Clear Living was brought in by Manchester architects Stephenson Studio

Below: The property in Gwynedd was incredibly exposed, so wind and airtightness were very important

