



**Guide to Specifying Glass Blocks - General considerations:**

- Glass block walls are self supporting, but not load bearing. In addition to their own weight, they can withstand wind loads, horizontal live loads and impact loads. A lintel provides the head for the panel to be anchored into whilst ensuring no downward pressure is placed on the glass blocks.
- Openings must be square and perpendicular and the opening dimensions must be designed to suit glass block modules. Glass blocks cannot be cut like masonry bricks or tiles. To calculate the minimum opening size based on using 190 x 190 glass blocks with 10mm joints, multiply the number of blocks by 200mm (190 block + 10mm joint) then add 10mm for the other mortar joint. This is the minimum opening requirement. Some mortar joints are the most commonly used. Some spacers can also be used for thinner joints. If openings have been prepared incorrectly or if you're installing glass blocks, or to create a tighter radii, when building a curved glass block panel.
- Glass block walls are connected to the surround by reinforcement bars being inserted into pre-drilled holes for panel anchoring. For best integral strength, panels should be installed into a four sided pre-prepared opening. The opening can be timber, brick, steel, concrete or block-work.
- Between the opening and glass blocks it is essential to incorporate expansion joints in the perimeter to allow the panel to expand and contract freely with temperature change. The foam must not be bridged by mortar (render/plaster etc.), and caulked with Butyl & Butyl expansion joint sealer (fire-retardant in fire-rated applications).
- Glass blocks should not be installed when the surrounding temperature is 5°C and falling or 30°C and rising.
- Using standard glass blocks the maximum panel size without intermediate support or slipp joints is 2500" with no dimension exceeding 6m in either direction. For TFSB and TFSB Fire blocks, the maximum panel size permissible is 3m in line with test specification.

Connection details are purely representative to demonstrate the principals how glass blocks can be constructed with U channels, or box sections, either for structural and practical purposes, i.e. other uses of glass blocks and render or aesthetic use.

The channel, PFC and box section dimensions are illustrative only and not necessary to scale.

Connection detail principles, should be designed and be specific to each project requirement and calculations checked and qualified by independent structural engineers.

**Accessories - Perimeter expansion joints.**

Glass blocks will expand and contract by 0.25mm per 10°C temperature change. Self expansion joints must be incorporated into the perimeter between the substrate opening and block, being caulked with a white silicone (or fire-stop mastic). This will usually look similar to a standard mortar joint. For the head and joints of an opening, 10mm thick foam is used. This is a white expansion foam. The horizontal expansion joint between the first row of glass blocks and the base of the opening is formed using high-density bitumen or neoprene material to support the weight of the panel. Alternatively two coats of bitumen emulsion can be applied as the barrier between the bottom course mortar joint and base of opening.

**Joint sizes and spacer pegs.**

10mm is the most common joint size for specifying and building glass blocks. A 190 x 190 block plus 10mm spacer equates to 200mm. Spacer pegs serve multiple functions: They prevent mortar seepage, increasing the number of courses that can be constructed in a day. They prevent stainless steel reinforcement bars coming into direct contact with the glass block as metal and glass have different expansion and contraction properties. When a spacer peg is fitted and the wall is finished, the ribs at the end twist off and can then be ground over.

Other spacers are available for the 80mm-thick blocks - 6mm and 6mm + 10mm and also for 100mm-thick blocks - 10mm + 10mm.

**Panel reinforcement and tying back to the perimeter openings.**

Stainless steel ribbed reinforcement bars are used to tie to the opening. The ribs penetrate the expansion material and anchor the panel in place by connecting to the perimeter frame. This can be located by drilling an over sized hole a minimum depth of 25-30mm as should be fitted with bitumen to cushion any movement of the re-bar. Ribs are 600mm long and when the panel is larger than the reinforcement bar, ribs are overlapped by a minimum of 50mm and are connected joined using the wire-tie file.

One reinforcement bar should be used in each horizontal and vertical joint as a minimum. More ribs may be required if using and glass blocks or a TFSB or TFSB.

For situations where connecting the ribs to the opening may prove difficult, panel anchors can be used (similar to the pin-in principle secured by either screw or bolt fixing or can mechanically slot fixed).

**Glass blocks specialist mortar - Colmef Vetromix**

Colmef Vetromix is a specially designed and formulated pre-mix mortar for glass block construction ensuring accuracy and consistency of performance. If not used internally, externally, straight, curved and fire-rated glass block walling. Vetromix has a few features, low slump and the whilst mortar available. It is used as bedding and pointing mix. Therefore there are no bonding issues between building and grouting. Pointing instructions are on the reverse of each bag and should be strictly adhered to. 10 litres will build approximately 1 square metre of 190 x 190 x 8 blocks. The surrounding temperature should be 5°C and falling or 30°C and rising and the joint width should not exceed 12mm.

**Expansion joint sealer/sealant.**

After construction, the perimeter joint should be checked of any residue mortar and caulked with Butyl & Butyl expansion sealer for fire stop mastic. Bridging the joint would restrict flexibility and movement and negate the expansion there and can cause glass blocks or joints to crack.

**How a mortar joint works**

Glass Block Technology mortar is a specially formulated pre-mix bedding and finishing compound, available if needed to be used with mortar in construction under factory controlled conditions so all additives are accurately blended and designed for maximum performance of strength, durability and appearance. The mortar joint must not cure in reaction to air just like mortar mortars, so it is important that the joint size is not too wide. This prevents the curing shrinkage. Mortar joints are not too wide. This prevents the curing shrinkage. Mortar joints are not too wide. This prevents the curing shrinkage. Mortar joints are not too wide. This prevents the curing shrinkage.

Glass is impervious unlike brick and concrete, therefore mortar is not absorbed into a glass block. The strength and support of a joint is created by the shape of the mortar profile itself. The edge or collar of a block is concealed so when you are laid next to each other as new joints are created. This edge joint enables the glass block wall to resist impact or applied loads resulting in the panel being stable and self-supporting, but not load bearing. It is for this reason that reinforcement bars are not required in the surrounding structure, whilst also giving the panel integral support and a wind-loading value. The mortar (recessed) joint is 10mm and the most common used is 10mm. However, this is only the distance on show, the centre of the oval joint is always deeper than the outer collar. This also houses the stainless reinforcement bars, which should never be in direct contact with the glass surface.

**GLASSBLOCK TECHNOLOGY**

170 Lodge Lane, Hyde, Cheshire SK14 4LB  
[projects@glassblocks.co.uk](http://projects@glassblocks.co.uk)  
[www.glassblocks.co.uk](http://www.glassblocks.co.uk)  
[twitter@glassblocks](mailto:twitter@glassblocks)  
 Tel: 0161 612 8893  
 Fax: 0161 285 1503

The data sheet connection detail & construction principles, should be designed and be specific to each project requirement or environment & calculations checked and qualified by independent structural engineers.

All information is accurate to the best of our knowledge at time of data sheet production, however Glass Block Technology Ltd. cannot be held liable in any way regarding the usage of glass blocks and the manner in which they are installed. Glass Block Technology Ltd. reserves the right to amend or correct changes at any time.

**TYPICAL GLASS BLOCK RODS & MORTAR SYSTEM MAXIMUM WIDTH WALLS**

**GBT105 Rev.**

Scale 1:7.5 & 1:2.5