

# VETROPIENO

The **VetroPieno block** is a 100% compact glass block that brings together the appeal of traditional blocks and the transparency and luminosity of glass. **Unlike traditional products that are hollow inside, VetroPieno can count on visual effects and movement created deep within the block to add transparency, passage of light, new beauty and fascination to the usual properties of this construction element.**

**Introduced by Seves glassblock as part of its collection, it comes in four versions: Neutral, Blue, Nordic and Siena, and provides another glass solution for decorating interiors and exteriors, focusing on more artistic and expressive qualities of the material. An original alternative to classic blocks to create stunning dividing walls that allow light to pass through into each room, or special nuances and furnishing accessories to add a touch of style, individuality and colour.**

The standard size and versatile shape allows it to be installed both horizontally and vertically for creating smooth surfaces, traditional designs, delicate frames or coloured light reflections.



**dimensions;** 24x11,7x5,3cm  
**weight;** 3,5 kg



**dimensions;** 12x11,7x5,3cm  
**weight;** 1,7 kg

Vertical structures with vetropieno are all those, indoor or outdoor, linear or curved structures that serve only as dividers. Consider the following parameters when building with vetropieno;

- dimensions of the surface to be built
- weight of the structure with vetropieno
- whether it will be indoors or outdoors
- the structural resistance of the supporting structure
- complexity of the shape/geometry

When designing with vetropieno, it is important to bear in mind the features of the three materials composing them: steel, adhesives and glass, in order to prevent any problems arising from an incorrect use of these elements. It is well known that glass passes from the elastic phase to breaking without the intermediate plastic phase typical of other construction materials.

Glass lacks therefore the characteristic that, in steel and reinforced structures, makes it possible to distribute loads and stresses over elements less subject to fatigue.

It is therefore important to avoid any load and external restraint conditions that would concentrate stresses on glass structures.

For this reason it is advisable to design isostatic structures when working with vetropieno.

A design with vetropieno that calls for hyperstatic connection with other (more rigid and solid) structures would subject the structure to critical stresses.

Moreover, when the dilatation due to temperature rises is prevented, this would generate a stress that could lead to breakage.

Experience acquired by specialised builders recommends structures that are free to deform and expand, so that the expansions and deformations of the various parts are independent.

During design and construction it is also important to remember that vetropieno must never be in direct contact with the metal sections or reinforcement bars that are needed for assembly.

# Basic elements for calculating and verifying glass structures with vetropieno

## Physical and mechanical properties of glass;

Modulus of elasticity:  $\approx 760.000 \text{ kg/cm}^2$

Poisson's coefficient:  $\approx 0.20$

Density / specific weight:  $\approx 2.5 \text{ g/cm}^3$  (2500  $\text{kg/m}^3$ )

Hardness (Mohs scale):  $\approx 6.0$

Linear expansion (between  $-20$  and  $+50^\circ\text{C}$ ):  $\approx 0.000007 \text{ cm/cm}^\circ\text{C}$

Seves glass products are manufactured with clear sodium lime glass or coloured in paste, are annealed and do not contain harmful substances.

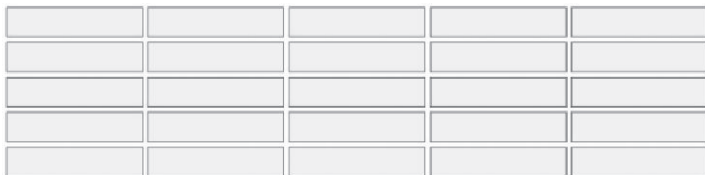
Vetropieno cannot have load-bearing functions, but it should only be used as curtains or dividers. These structures are considered self-supporting and therefore do not play any structural role, since they are only capable of safely sustaining their own weight together with the horizontal load generated by the wind and any perpendicular impact.

## Anchor sections for walls with Vetropieno

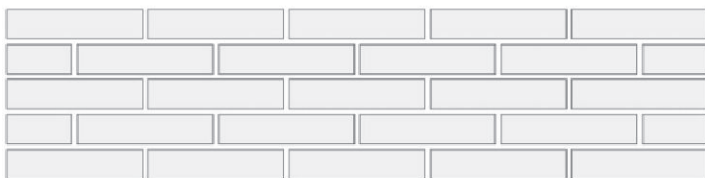
When designing Vetropieno walls it is always important to provide adequate perimeter supports for the stability of the wall. It is fundamental to allow for both settling and expansion, by providing a 6 mm expansion area with the Seves expansion joint. Vertical and horizontal load-bearing structures that support Vetropieno walls must feature the suitable dimensions and structural resistance. There are two types of anchoring methods:

Continuous restraint along the entire vertical edge of the Seves structure, obtained by using metal sections or "U" section channels. The internal size between the flanges of the profiles or of the channels must be even and higher than the thickness of Vetropieno, in order to facilitate sliding movements.

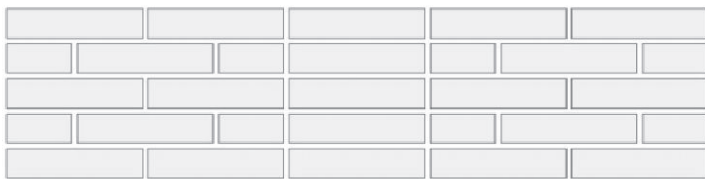
Dowel restraint obtained by extending the reinforcement bars, which are used in all horizontal joints, into holes in the adjacent load-bearing vertical structures. The diameter and the depth of these holes must lightly exceed the bars in order to allow sufficient clearance.



solution A: 60 pcs/m2 of rectangular vetropieno



solution B: 53 pcs/m2 of rectangular vetropieno  
14 pcs/m2 of squared vetropieno



solution C: 45 pcs/m2 of rectangular vetropieno  
30 pcs/m2 of squared vetropieno



solution D: 45 pcs/m2 of rectangular vetropieno  
30 pcs/m2 of squared vetropieno

## Dimensional limits

When constructing walls with vetropieno, it is recommended to divide the wall into sections that considers the weight of the glass structure on supporting structure (around 230  $\text{kg/m}^2$  of vetropieno installed horizontally + the weight of adhesive and reinforcing).

**For surfaces over 4 m<sup>2</sup> (higher than 3 m and larger than 3 m) specific structural calculations are needed.**

***In any case it is recommended to check the structural resistance of supporting structure in order to install safely.***

For this division the designer shall place between the walls an expansion and settling joint measuring about 1 cm and made of root-proof material.

***Vetropieno wall interruption;*** Where structural needs require the division of the panel in different parts, it is advisable to insert between the panels an expansion/slip joint where the structural continuity of the panel is interrupted.

***Vertical interruption;*** The insertion of metal joints with blade or profile metal joints allows the interruption of a vertical wall and guarantees an optimum expansion and slip tolerance.

***Horizontal interruption;*** When the panel is to be horizontally interrupted with a joint, an anchoring device to the bearing structure of the building shall be provided for.

# Installation materials

## Adhesives

For Vetropieno walls use preferably;

- organic mineral adhesive for the high-adhesion, high chemical, mechanical and structural resistance,
- multi-component epoxy adhesive for smooth surfaces
- structural silicone

The adhesive should have good mechanical strength and at the same time be easy to work in order to completely and properly fill narrow spaces.

Furthermore, it must be water-proof and shrink minimally during setting.

Excessive shrinkage creates stresses which are harmful to glass blocks and can cause cracks to the detriment of water-proofing features.

Check always the technical sheet and the security data of the adhesives before using.

For further information contact the Seves Technical Assistance Service

## Steel reinforcements

We recommend using stainless steel bars (available at Seves).

The size of the rods varies according to the designer's calculations and the need for endowing the structure with sufficient structural strength.

Furthermore, the rods must not touch the glass. For what concerns the joints, we recommend the following rod diameters:

- For 10 mm joints: maximum diameter = 6 mm
- For 16 mm joints: maximum diameter = 8 mm.

## Protective treatments and sealants

After you have completed the installation, you can add protective treatments on the joints to prevent water infiltration.

This is indispensable for Seves structures exposed to rain and for shower stalls.

The treatment usually consists of one or more layers of transparent water-proofing protective material.

We recommend that you apply a sealant around the perimeter of the structure to prevent the joints from cracking where in contact with other structures.

## Slip and expansion/settling joints

It is necessary to place suitable materials laterally and upper that can absorb any settling of the structure, such as the Seves expansion joint that is adhesive on one side in order to guarantee an easy application on the structure, this is 6 mm thick.

At the base a slip joint shall be placed in order that the wall does not belong to the same structure of the building.

## Spacers

In order to make installation faster and easier, *wooden spacers can be used*.

Spacers have to be differentiated in relation to the size of the joints, and the positioning of Vetropieno (horizontal or vertical installation) and the type of wall (linear or curved).

## Installation

The walls must lean against and be anchored to rigid, appropriately sized supporting structures, these must be rimmed with root-proof material that is thick, dense and hard enough to absorb structural expansion, settling and slipping.

1. Make sure that the supporting structures are vertical and horizontal.  
Place two wooden strips horizontally on the surface where the wall will be built.  
The strips must follow the wall, and the distance between them must be equal to the thickness of the glass blocks you will be using. Arrange the vertical guides, they must be plumb, and 100/120 cm apart to assure that the wall itself will be perfectly plumb. The wall must be perfectly vertical both lengthwise and upwards in order to avoid eccentric loads.
2. Place a slip joint into the horizontal strips to prevent expansion/friction between the base of the panel and the supporting surface. Place the expansion/settling joints on the side and at the panel support points.
3. Use a trowel long enough to allow you to work easily between the vertical reinforcement bars. Apply the adhesive between the base strips, it must be at least 1 cm thick and proportionate to the height of the wall. Position the first row of *Vetropieno*.
4. Build the first course perfectly plumb. Use the wooden spacers to make even joints. Apply the adhesive to the vertical spaces between *Vetropieno*.
5. Place the reinforcing rod / bar on the central part of glass and avoid any contact with glass. Make sure that each *Vetropieno* is surrounded by well compacted and evenly distributed adhesive on all sides and that the bearing structures do not touch them. Insert the reinforcement bars, horizontally; the bars should not be more than 50 cm apart. Use a piece of wood to remove excess adhesive from the joints before it hardens; this is in preparation for the finishing phase. Wipe the glass with a wet sponge to remove any residue. If the wall reaches to the ceiling, position the expansion/settling joint the same way you did on the sides.
6. To guarantee stability for small and medium size walls, fix them to the adjacent supporting structures with the horizontal reinforcement bars inserted in the structures themselves. The diameter of the holes should be slightly bigger than that of the bars over a sufficient length so they also pass through the expansion/settling joint and they not tilt. For large walls (over 4 m<sup>2</sup>) it is better to use U-sections, which are plugged or cramped to the adjacent supporting structures. To prevent the metal from touching the glass, position the first row of *vetropieno* at least 10 mm from the wings of the section. When using U-sections, place the expansion/settling joint inside them.
7. Finish the joints when the adhesive is completely hardened.
8. Apply the finishing, fill the joints well; use soft brushes and plastering trowels. Make a perimeter cordon, or part of the outside joint, using structural sealant to prevent cracking along the expansion/settling joints.

### **Cleaning Vetropieno**

*At the end of the installation activity follow these instructions for a suitable cleaning of the product:*

*Remove any rims or adhesive spots using diluted hydrochloric acid (such as muriatic acid, products that remove calcareous deposits or similar products) or acetic acid (such as white wine vinegar). Take care not to go over the joints and take the necessary safety precautions for using such substances.*

*Do not use oily solvents, hydrofluoric acid or alkaline solutions (such as soda or similar substances).*

*If you use finishing mortar that contains additives, test it first on some spare glass blocks of the same type used to build the wall. Apply the product and clean the glass blocks according to the manufacturer's instructions.*

The information contained in this technical document is accurate and reliable to the extent of our knowledge to date. Since Seves S.p.A. – Seves has no way of controlling installation conditions and methods, the use of appropriately skilled labour, and the proper use of the accessory materials, no guarantee can cover materials that prove defective after installation and/or assembly.

**SEVES  
GLASS  
BLOCK**