Xella



Installation guide Ytong Modular Wall Panels



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1. Introduction

The Ytong Modular Wall Panel system is designed for the quick and cost-efficient construction of innerleafs, internal and seperating walls as an alternative to traditional blockwork. The Ytong Modular Wall Panels are delivered to the building site as modular elements and only need to be assembled. This construction allows the inner leaf to be constructed prior to the brickwork. Xella have been manufacturing Ytong Modular Wall Panels for decades from various plants around Europe.

The Ytong Modular Wall Panel system offers complete freedom of design and construction, subject to certain obvious requirements such as the structural stability.

Accreditations:

R	Lloyd's Register	BLP Working top for a sufer w
	Lloyd's R	egister EMEA
Buil	doffsite Property A	ssurance Scheme (BOPAS)
	This is	to certify that
	Xella	UK Ltd.
	has been awarded 8	OPAS Accreditation to the
Y	tong Modular Aerate	d Concrete Building System
The scope of ap Design; Off Site Manufa 60-year durabilit This Approval is Satisfaction Sun	proval includes the assessment o cture, and On-site Construction y and maintenance assessment subject to: ellarge Assessments	of the following, systems, processes and competence (94/) and
Approval Numb	W PRU11061232	
Date of Expiry	31/03/2022	A CA
BOP	AS	Andrew Carter Senior Utilities Assessor Lloyd's Register EMEA A subsidiery of Lloyd's Register Group Limited

2. Products

Wall Panels

Load-bearing



Standard panels G4/600

- Width: 600-750mm
- Length: up to 3000mm
- Thickness: 100mm
- Compressive cube strength fck \geq 4N/mm²
- Thermal conductivity = 0.16 W/mK
- Dry weight density = 580 kg/m³

Tolerances

- Length: ±3mm
- Width: ± 2mm
- Thickness: ± 2mm

Sound insulating Panels G5/800

- Width 500mm
- Length: up to 3000 mm
- Thickness: 100mm
- Compressive cube strength fck >= 5N/mm²
- Thermal conductivity = 0.22 W/mK
- Dry weight density = 720 kg/m³

The panels, when installed and exposed to an excentric vertical load of 200kg, should not deflect more than L/500 or max 5 mm Moisture content on delivery : maximum 20%

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YTONG Fix P

Thin bed mortar

YTONG-fix P (Panels) thin joint mortar is specially designed for use with YTONG aerated concrete panels. YTONG-fix P is supplied dry and in pre-mixed 25kg bags. Pour approximately 6 l (5.5 to 6.5) of water into a clean large bucket or tub and add the content of 1 bag (= 25kg) of Ytong Fix-P. Mix mechanically (using a speed of 200 rpm) for 4 minutes to ensure that water can mix with all the cement particles and until a thick smooth consistency is achieved without lumps.Leave the mortar to rest for 10 minutes and remix before using. It remains workable within the bucket for ± 4 hours. It will reach its initial bond strength within 7 to 10 minutes, and full design bond strength within 28 days. YTONG -fix P should not be used In temperatures below 0°C.



Dry bulk density

1.425 +/- 75 kg/m³ Compressive strength ≥ 10,0 N/mm² Initial shear strength ≥ 0,3 N/mm² Chloride content < 0,1 % m/m Reaction to fire Class A1 Water absorption < 0,35 kg/m².min0,5

Water vapour permeability 5 / 20 Thermal conductivity λ = 0,52 W/mK Bond strength ≥ 0,30 N/mm² Bond strength ≥ 0,30 N/mm²

Workable life : ≥ 4 hours Correction time: ≥ 15 minutes



YTONG Fill

YTONG fill is a filling mortar intended to be used to fill chases and grooves as they are required for the incorporation of conduits.

Please follow the instructions on the bag.



corrugated nails

Corrugated nails

The corrugated nails (40 x 40mm) are to prevent movement between the panels whilst the mortar hasn't set fully.



Stainless-steel finned helical remedial wall ties diam.8mm and 220mm long. The helical tie (220mm) is used in each corner and hammered into middle of the joint at 300mm centres.

The helical wall ties are not supplied by Xella. The specification of the ties must be met.

3. Tools

The construction method requires the use of the following materials and tools:

a. One crane per construction team.



Crane minimum capacity: height 15m - reach 16m - load 500kg at the tip

 A certified clamping device for placement of the Ytong Modular Wall Panels.



- c. A thin bed mortar dispenser, suitable for the thickness of the Ytong Modular Wall Panels used. An even spread of the correct thickness of thin bed mortar in the bed joints can only be achieved by using this thin bed mortar dispenser.
- A thin bed mortar scoop designed for the thickness of the Ytong Modular Wall Panels used, which evenly applies thin bed mortar to the butt joint surfaces.
- e. A paddle mixer for mixing thin joint mortar.
- f. A scraper knife for removing excess thin bed mortar.
- g. A pump truck for maneuvering pallets.
- h. A handsaw and electric saw.
- i. A hammer.
- j. A spirit level.
- k. A measuring tape.
- l. A trowel.
- m. A brush.
- n. An aluminum ruler.
- o. Cord.
- p. Finishing and plastering tools.



4. Ordering and delivery procedure

Offer stage:

The building contractor provides the information concerning the building project to be executed in Ytong Modular Wall Panels (including the construction drawings on a scale of 1:100 or 1:500) and requests a quotation. Based on price calculations at the factory, Xella sends a quotation to the builders' merchant and/or the building contractor.

Execution of order:

The builders' merchant or contractor provides Xella with the purchase order. Xella produces wall drawings based on the final architectural and structural drawings.

The wall drawings are sent to the building contractor and/or client for approval.

Upon approval of the wall drawings, all required wall panels are manufactured, cut to size at the supplying factory and prepared for transportation.

Delivery at buyer's option:

Deliveries take place according to a delivery schedule to be agreed upon by the contractor and Xella prior to the agreed date of the first delivery.

Upon receipt of the order, the Ytong Modular Wall Panels factory makes wall drawings for the walls that are to be built in Ytong Modular Wall Panels, based on the final architectural and structural drawings that were received earlier (see illustration).

The client, or the structural engineer of the client, will take the responsibility for all structural aspects of the building. This includes the strength, stiffness and stability of the building as a whole and the strength, stiffness and stability of the individual panels.

Xella will assist the structural design process by declaring the characteristics related to its products.





These wall drawings are sent to the client for approval, before cutting of the wall panels can begin.

Deliveries are based on a delivery schedule. The building contractor, the logistics department and the supplying factory contact each other directly in order to schedule the delivery at buyer's option. Ytong Modular Wall Panels are always supplied at buyer's option and in full truck loads. The Ytong Modular Wall Panels are delivered on articulated lorries for forklift offloading. The trucks will only deliver Ytong Modular Wall Panels on suitable roads, nearest possible to the site, where they will be offloaded by the building contractor.

The Ytong Modular Wall Panels should be stored on a level area and kept free from rising moisture, rain or dirt. The site manager should report shortages/damage and sign for the goods received.

5. Preparation

Start construction by making a construction site layout and include the location of the crane.

Next, draw up a supply schedule and time schedule.

Lay diagram floors from back to front in connection with safety assembly plow. Plan the delivery of the first of Ytong Modular Wall Panels and auxiliary materials 10 days ahead of the start of assembly.

For the storage of Ytong Modular Wall Panels, a stable and load-bearing surface is needed. The packs should not be stored on the upper-floors.

Storage area to be located as close to the plots as possible to minimize movement.

The packs can be stacked.

Scope of self-discharger from the paved road 2.5m, packages must be 20cm apart.

When opening packs, before cutting the straps, it is good practice to temporarily fix restraint across the elements to minimize the risk of elements toppling. It is essential that suitable handling equipment is available to ensure the packs





can be transported and handled safely during the whole installation If a forklift is required to handle the panels, adequate steps should be taken to protect the elements from direct contact with the forks.

Ytong Modular Wall Panels						
Density	Max. length (mm)	Thickness (mm)	Width (mm)	Weight for transport kg/m³	N° per pallet	Ytong fix per m² (kg)
AAC4/600	3000	100	600	780	7	0.84
AAC5/750	3000	100	500	920	7	1



Team composition:

- 1 person at the storage yard (applying thin joint mortar and positioning the grab on the panel)
- 2 people at the assembly place
- 1 crane operative



The foundation should be at least 150mm higher than ground level along the entire perimeter to avoid drainage problems and damage in the future. The substructure forming the base on which the Ytong Modular Wall Panels are erected is critical to the installation of the wall panels.

Check if the base is square:

Measure length of the wall Deviations in length must not exceed \pm 5mm for lengths up to 10m of the working drawing and \pm 10mm for over 10m in length.

Measure diagonally from corners If measurements are equal the base is square. Acceptable deviation is ± 5mm for lengths up to 10m and ± 10mm for lengths over 10m. Surface level must not exceed ± 5mm from datum.

Mortar preparation

Do not prepare more mortar then can be applied within one working hour. Check the expiry date on the bag.



Cover the mortar to avoid pollution and drying out.



The wall drawings must be kept safe and available during the entire installation process.









6. Checklist structure



door opening positions are correct.



levels and edges +/- 5mm.



dimensions +/- 5mm for lengths up to 10m dimensions +/- 10mm for lengths up to 10m



scaffold signed off.

7. Assembly wall panels

Setting Out

Prior to the installation of the elements, a timber guide rail should be fitted to the floor to provide a reliable alignment aid to the installers.



Setting Out/Installation

Check if top of substructure is level and within tolerance ± 5mm. Ytong thin bed mortar is applied on DPC

In case the tolerance of the substructure exceeds ± 5mm then Xella recommends using kicker course blocks laid in a traditional mortar bed to even out the substructure.

Always start with the installation of the first panel at the far end of the crane. Two people position the element. The first panel is placed in the corner in a bed of Ytong thin bed mortar (either directly on to floor slab or in case the tolerance of the substructure exceeds ± 5mm on top of kicker course block). The first element erected must be plumb and level. Temporary props are used to stabilize the panel. The props should be installed at an angle of 45 degrees. Ensure that all props are fixed.



Head: 4 x Sormat KBRK 65 x 8mm screws into element

Sole: 2 x Sormat KBRK 65 x 8mm screws into ground floor concrete or first floor deck





Installation

The second wall panel to be installed should form the corner with mortar applied to both elements. Fix all corners by hammering 220mm helical ties into middle of joint at 300mm center.

The remaining panels are propped with an average of 1 prop per 3 elements.



plan view



section view



± 3mm continuous mortar joint , above and below the DPC

Application of mortar

- always clean the surface of the panels and the floor.
- Ytong Modular Wall Panels are joined together with the Ytong thin bed mortar, using a dispenser and a scoop.
- the mortar must fill the joint and this can be evident by mortar squeezing out of the joints on both sides of the element when installed.
- excess mortar must be cleaned off face of element before it hardens.

Installation

The panel is picked up with a specially developed clamp that lifts the element at the end and lifts it from a horizontal to a vertical position.



The crane lifts and turns the element to the installation place.

With the help of 2 persons, the panel is placed in the right position.



Approximately 40 mm above the floor, push the bottom side of the panel towards the facing panel. Slowly move the clamp in the same direction until the mortar is pushed out of the joint.





Lower the panel until the final position. For a firm contact, you can lift and lower the panel again for approximately 40-50mm.



Check if the panels are in line, then fix a corrugated nail on top of the two panels.



Check if the panels are even and fix 3 corrugated nails in each vertical joint.

Installation - openings:

In case of delivery of only standard wall panels to site, the panels are cut on site prior to the installation of the wall panel to accommodate wall openings. In order to prevent damage due to hygric shrinkage, Xella advises to make an expansion joint at one side of the lintel of the opening. Walls longer than 8 meters must also be dilated. The dilatations are indicated on the Xella's assembly drawing. Lintels are placed on traditional sand cement mortar to create slip pane.





Mortar



Foil (DPC 2000)

Use a corrugated nail in the corner where a long panel meets a shorter panel.



Always check if the walls are level using a long straight ruler and in case the panels are uneven place three corrugated nails in each vertical joint of two panels.



Nailing and fixing across joints

- Secure adjacent elements with corrugated nails across the joint in the element top.
- Use corrugated nails vertically along the joint at a maximum spacing of 1m with minimum 3 corrugated nails per joint.
- Fix all corners by hammering 220mm helical ties into middle of joint at 300mm centers.



Remove excess mortar before it hardens, at least after finishing a wall.

If necessary, the panels can be cut on site.

Draw a straight line with a chalk-line, a ruler or a strip of wood.

Use an circular saw with the right blade to cut the panel to the required width.

Verify that the distance between the walls is accurate using a laser measure.

Continue with the wall panels of the first floor in the exact order as the ground floor.









8. Checklist walls

	Elements to be kept damage free and any damage is repaired using Ytong repair mortar
	All joints to be finished flush bond of mortar on face of panel. Care should be taken to avoid getting mortar on the face of the panel
	Ensure all panels are correctly bedded and positioned as per lintel schedule with correct bearing.
	Panels are propped with an average of 1 prop per 3 elements.
	All panels to be installed as per Xella's wall drawings and are plumb and level.
	Corrugated nails are used at every joint with minimum of 3 per joint and one at the head.
	Helical ties are used at corners at maximum 300mm centres
\checkmark	Ensure all openings sizes, heights and positions are correct.

9. Installation of cavity wall ties

Xella recommend using a thin joint block tie such as the Staifix – Tjor Helical TJ2 wall ties.

The wall ties are hammered directly into the Ytong Modular Wall panels, through the insulating material and are built into the bed joints of the outerleaf of brickwork. Helical wall ties are driven into vertical elements at centres shown around openings and bedded in brickwork mortar joint.

Length of tie to suit cavity width and allow at least 70mm embedment into vertical element and brickwork.

ties per m²



Eternal wall

10. Service chases

Channels for services can be made using the manual chasing tool or a circular saw. These should not exceed 30mm in depth for vertical chases and 0mm for horizontal or inclined chases.

11. Repair of wall panels

Minor cosmetic repairs

These repairs are general where the areas do not exceed 30mm deep and the overall length and width are approximately 200mm. Use Ytong-fill and follow the instructions on the bag to prepare the mixture. The areas to be made good are filled with the mixed paste and flush smooth with a trowel in one application. Once the infill material has hardened, it should be rubbed over using an abrasive paper or an aircrete block to assimilate the texture of the surrounding panel. However, there will remain visual differences in texture and colour of repaired areas to the main panel.

Major crack or crack over total width of panel



- Make a clean straight cut with a AAC diamante cutter to remove the defected area
- Rectify the panel to the required size by fixing a part of a non-defective panel or block with a fully filled joint of Ytong Fix P thin layer mortar
- Any small surface defects adjacent to the repaired crack can be rectified with the mortar or Ytong fill
- Let the repaired panels harden for at least 3 days before handling

"Clean" crack over total length of panel



- Separate the two parts and clean the broken surfaces with a stiff brush
- Rectify the panel by fixing both panel sides with Ytong Fix P thin layer mortar, the joint should be fully filled
- Any small surface defects adjacent to the repaired crack can be rectified with the mortar or Ytong fill
- Let the repaired panels harden for at least 3 days before handling

Crack in an installed panel



- The crack needs to be further rasped open on both sides with a sharp tool for about a depth of 25 to 30mm.
- Apply, on both sides of the crack, every 50cm, a corrugated nail
- Clean the crack properly no dust should remain
- Fill the crack with Ytong Fix P thin bed mortar
- Once the Ytong Fix P has set properly the repaired area can be flattened.
- In case the panels are finished with a plaster, a 500mm wide plaster mesh can be applied once the repaired area has dried out.

12. Installation – floor casettes



250mm infill blockwork between joists

floor cassette bear directly over ground floor element with 90mm bearing

13. Installation roof trusses at eaves



Trusses fixed to wall plate to truss clips

50mm x 100mm C16 wall plate on a mortar bed. Strapped at max. 2m centres with galvanized steel straps

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