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**material science
that shapes
the future**

Construction Manual

Construction Manual



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 **PHOMI** HOLDING



Prologue

Carbon-zero Coverings derived from PHOMI econic clay material is a new energy-saving architectural decoration materials. The construction method is different from the traditional materials.

The comprehension of base course classification, product category, full process, maintenance and repair methods before construction can effectively reduce the after-sales problems caused by improper treatment of the construction, which will help streamline the process, respond promptly to the buyer's concerns, and provide solutions. In the process of construction, the constructor always encounter various issues such as product cutting, external angle treatment, interior angle treatment, seam treatment. If these details are not handled properly, it can lead to safety hazards after delivery, affecting the constructor's reputation.

If designers or constructors wish to adopt different methods or have amendments/supplements, we welcome feedback.

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Preparation before Construction

Industry Standard Reference:



1.1 Construction Environmental Requirements



During the construction of external wall products and within 24 hours after completion, the temperature of the base course and the construction environment should not be lower than 5°C or higher than 40°C. In summer, sun exposure should be avoided, and the construction should be prohibited in strong wind exceeding level 5, rain or snow. Effective measures should be taken during the construction to prevent the wall from being washed away by rain or falling water from high places. The base course should be free of cracking, hollowing, staining, dust and oil should be cleaned up, and the wall should have sufficient strength adhesion.

After the treatment of the base course wall, its surface flatness, perpendicularity external and interior corners, squareness should be met the basic plastering requirements in the table of Code for Construction Quality Acceptance of Building Decoration.

The position of doors and windows, hole, balcony and downpipe pre-embedded parts should be completed. The base course is inspected and approved according to the design requirements and quality acceptance standards.

In order to ensure the quality of construction, should choose a mature construction team with professional exterior wall construction qualification and safety equipment. If constructors have previous experience in the construction of split bricks, they will also be able to effectively complete the paving of architecture materials derived from PHOMI econic clay materials. If constructors do not have experience in this area or do not know how to work with exterior wall brick at all, do not work blindly. If you need technical guidance, you can contact PHOMI to appoint technicians to guide the construction or recommend a professional construction team.

1.2 Construction Site Management

1.2.1 Unloading and Counting



1. Forklift unloading



2. Laying the box flat



3. Counting the goods

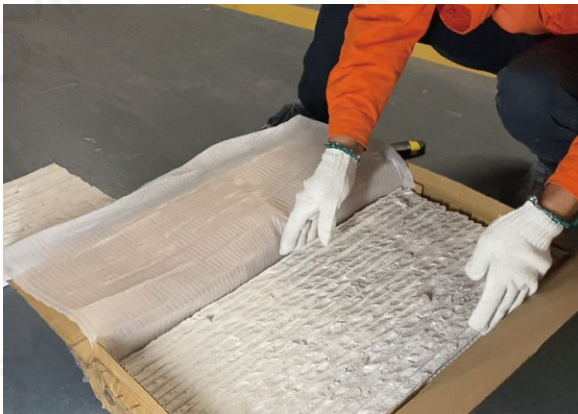
Precautions:

1. After the arrival of the products, count the number/category/colour number/specification of the products at first time
2. If there is any error in the goods, they should be promptly reported to the seller.
3. When stacking the goods, control the height <1 metre, in order to avoid the deformation of the products under Compaction.
4. During outdoor construction, rainproof measures should be taken for the goods.

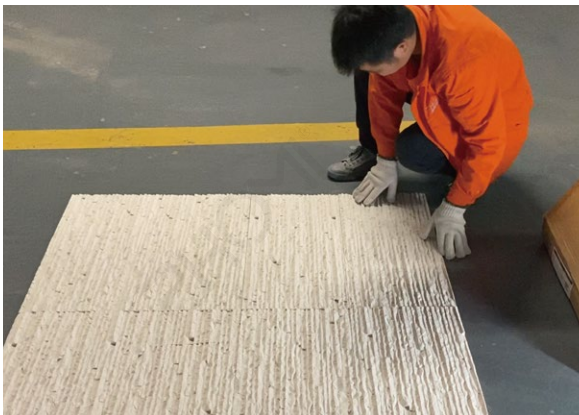
1.2.2 Unpacking and Inspection



1.Open the box



2.Take out the goods



3.Check the goods



4.Photography feedback

- Precautions:
- 1.Open the box to check the goods before paving the products on the wall
 - 2.If there is any quality problem, do not pave on the wall, you should shoot uninterrupted video feedback to the seller.

1.2.3 Carrying of goods

Size below or equal to 1200mm x 600mm



Method 1: carrying boxes
 Applicability: Lower volume of goods moved
 Key points: move out with both hands flat.



Method 2:trolley handling
 Applicability: higher volume of goods moved.
 Key points: first move the goods on the cart, and then push the goods smoothly.



Method 3: trailer handling
 Applicability: higher volume of goods moved.
 Key points: first move the goods on the trailer, and then haul the goods smoothly.

1.2.4 Storage of goods

Size larger than or equal to 2400mm x 1200mm



Method 1: Flat lifting

Applicability: move to a low-rise building with wide doors.
Key points: (1) At least two people cooperate to move out a piece of pearl cotton from the wooden box
(2) hold the surface of the product flat, and do not forcibly/drag the product, so as to avoid crease/break of the product.



Method 2: Roll lifting

Applicability: transport to a long distance.
Key points: the product should be rolled up along the long side with the right side up, and the diameter of the arc should not be too small to prevent the product from cracking.
Notice: this method cannot be used when the environmental temperature is too low, or the product texture is too thick/hard.



Temporary storage of rolled products

Please leave the rolled products standing for the time being.



Products with storage time ≥ 3 days

The packing rope needs to be untied and then laid products flat and stacked them neatly, and no one can step on it randomly



Store products packed in cartons

Store in a dry and ventilated room, and the stacking height shall not exceed 1m.



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2 List of construction tools

According to the drawings and project conditions, prepare a detailed material order supply plan list, and please test the machines and tools before construction to ensure their good performance.



Leveling instrument

Large wooden ruler (>80cm)

Tape measure

Paper knife

Chalk line reel



Portable cutting machine

Plane plate

Sawtooth trowel

Masking paper

Triangle bag (for filling caulking agent)



pointing strip



Towel or Sponge

Construction Tool Preparation

The following tools are added with powder adhesive:



Tools for temporary fixing:



Special adhesive Preparation and Application

3.1 Preparation and Application of Two-component Adhesive for external walls



80 mesh quartz sand
(used for external walls construction)



Two-component Adhesive

Preparation methods:



1.pour emulsion B into the barrel



2.Pour 80 mesh quartz sand



3.Pour in component A



4.Stir for 5-10mintues



5.Stir until it is creamy



6.Scrape pulp behind the product

Precautions:

1. The ratio is 1:1:1
2. The unused adhesive must be sealed and preserved, and it should be stirred evenly again when it is used again
3. A set of standard external adhesives can be used to paste 25-28m² conventional products(Data is for reference only. Subject to actual construction conditions).



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3.2 Preparation and Application of Two-component Adhesive for interior walls



Two-component Adhesive

Preparation methods:



1.pour emulsion B into the barrel



2.Pour in component A



3.Stir for 5-10mintues



4.Stir until it is creamy



5.Scrape pulp behind the product

Precautions:

1. The ratio is 1:1
2. The unused adhesive must be sealed and preserved, and it should be stirred evenly again when it is used again
3. A set of standard interior adhesives can be used to paste 7-10m² conventional products (Data is for reference only. Subject to actual construction conditions)



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4.1 Base Course Classification

In construction, base course is the construction layer under the surface layer. As the construction materials derived from PHOMI econic clay materials are thin and light, they are able to be directly pasted on a variety of the base course, and can be composited and firmly pasted with a variety of materials.

Cement mortar base course

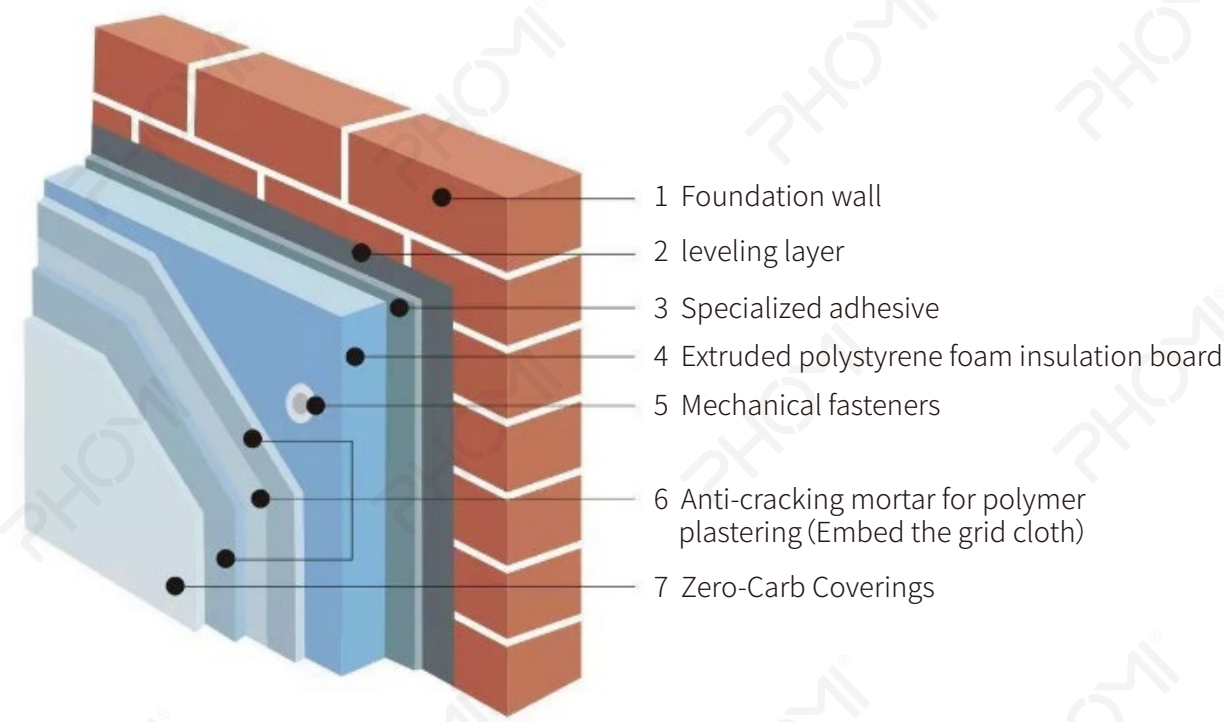
If the base course is a new building, it shall be cleaned before construction to ensure that the base course is clean, solid, free of hollowing and pollutants. The construction can be started only after there is no water at the base course.



External Wall Construction

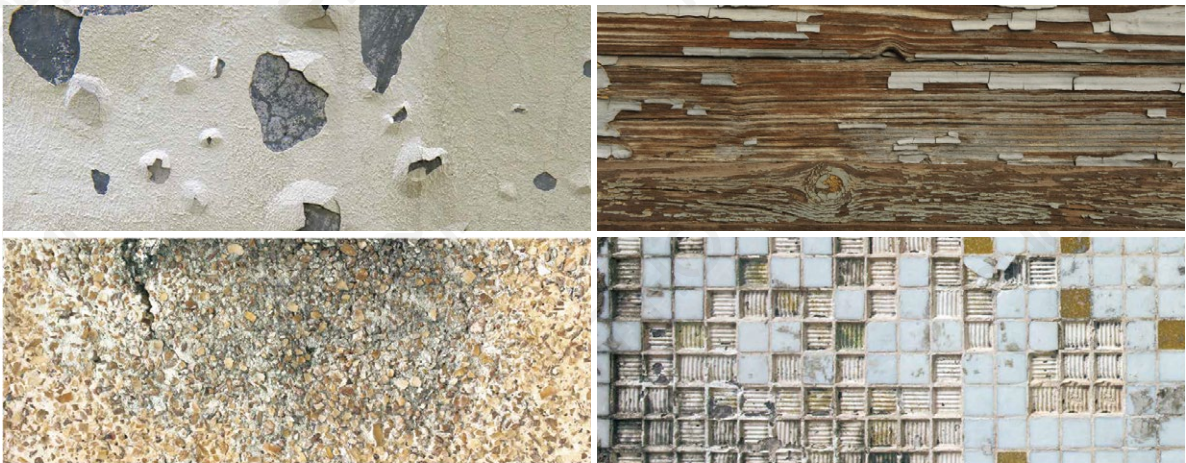
Insulation base course

When the base course is the insulation base course, the insulation material shall be fixed on the wall according to the Technical Specification for External Thermal Insulation Engineering of External Wall, and the steel mesh shall be fixed on the surface of the insulation material with plastic expansion bolts. The steel mesh shall be laid horizontally and compacted tightly, and there shall be no gaps, wrinkles, warpage and exposure, and the lap width shall not be less than 100mm; wipe the bottom anti-crack mortar with a thickness of 3mm, and immediately arrange the mesh cloth on it, so that the mesh cloth is tightly attached to the bottom anti-crack mortar; before the bottom anti-crack mortar condenses, coat the anti-crack mortar with a thickness of 3 mm.



Old decorative facing

Old veneers shall be thoroughly cleaned of floating dust, oil stain and moss.



Old veneers are ceramic tiles, stone walls, mosaics, stones, the hollowing, cracking, loosening and peeling parts of the veneers should be removed, and the polymer cement mortar should be used for repairing and leveling, and the interface agent should also be used to interfacial agent. the whole base course;

Old veneers are aluminum-plastic plate, the surface of the aluminium panel should be scratched and the interface agent should also be used to interfacial agent the whole base course;

Old veneers are paint, the loose,hollowness and Pulverization parts of the paint should be removed. When the putty is not water-resistant, it should be completely removed, and the polymer cement mortar should be used for repairing and leveling. The interface agent should also be used to interfacial agent the whole base course;

Old veneers are wallpaper, the original wallpaper should be removed. After the original base is inspected and repaired, the interface agent should also be used to interfacial agent the base course;

Old veneers are solid wood or composite wood , outdoors should be waterproofed on the wood surface; indoors can be directly pasted products.

4.2 Paste Process Demonstration

Split brick and other small-sized products.



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Case



1.Snap line location



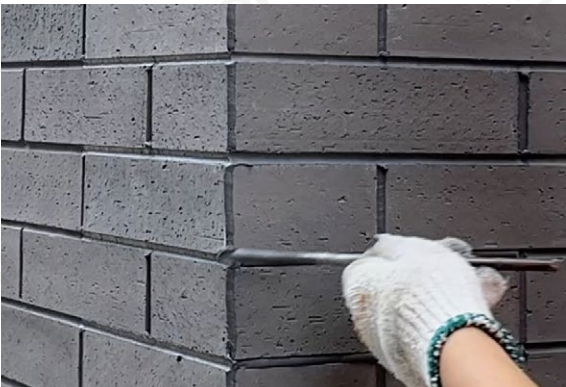
2.Scraping Paste



3.Paste



4.Caulk



5.Grout



6.Clean

*More operating points of external wall construction can be found in P27~P33.

Stone materials and other 1200*600mm medium-sized products



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Case



1.Snap line location



2.Scraping Paste



3.Paste



4.Caulk



5.Grout



6.Clean

*More operating points of external wall construction can be found in P27~P33.

Stone materials and other 2400*1200mm large plate products



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Case



1.Snap line location



2.Scraping Paste



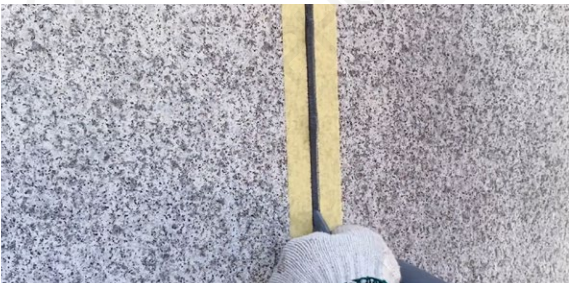
3.Paste



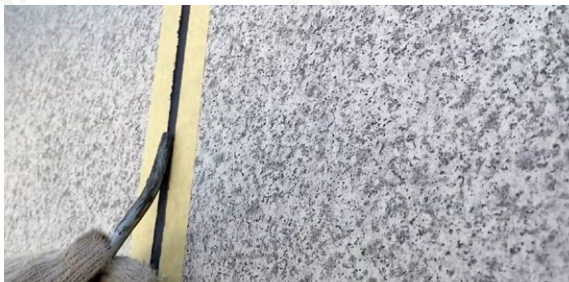
4.Compaction



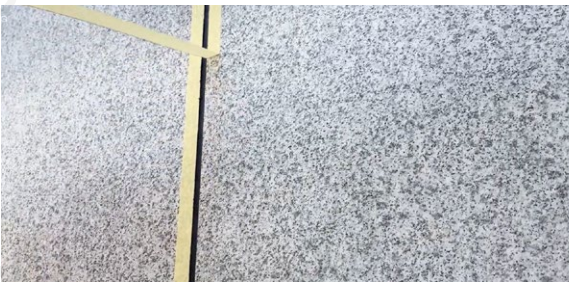
5.Paste masking paper



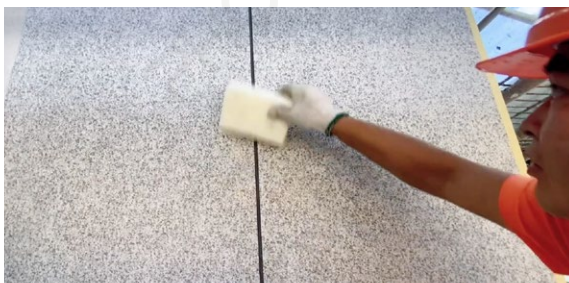
6.Caulk



7.Grout



8.Tear off masking paper



9.Clean

*More operating points of external wall construction can be found in P27~P33.

Natural concave and convex product



Scan code to watch construction video tutorial



Case



1.Snap line location



2.Scraping Paste



3.Paste



4.Compaction



5.Clean

*More operating points of external wall construction can be found in P27~P33.

Key construction links

>> Scraping Paste process

For flat products

The pulp fullness on the back of the product should be above 90%, the pulp thickness should be 1-2mm, and pull out full and uninterrupted jagged stripes.



For concave and convex products

Scrape the pulp on the back of the product, and pull out full and uninterrupted serrated stripes with a pulp thickness of 1-2mm.



>> Paste process

Adhesion should be carried out from top to bottom, using both hands to move back and forth, so that the product is flatly adhered to the base course wall as shown in the snap line

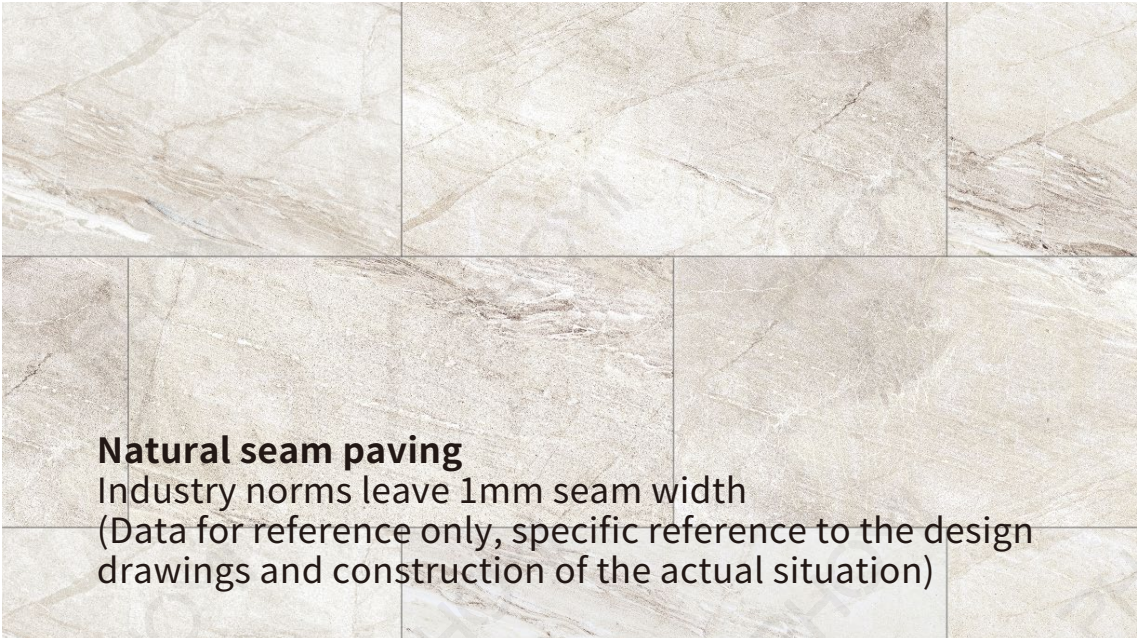
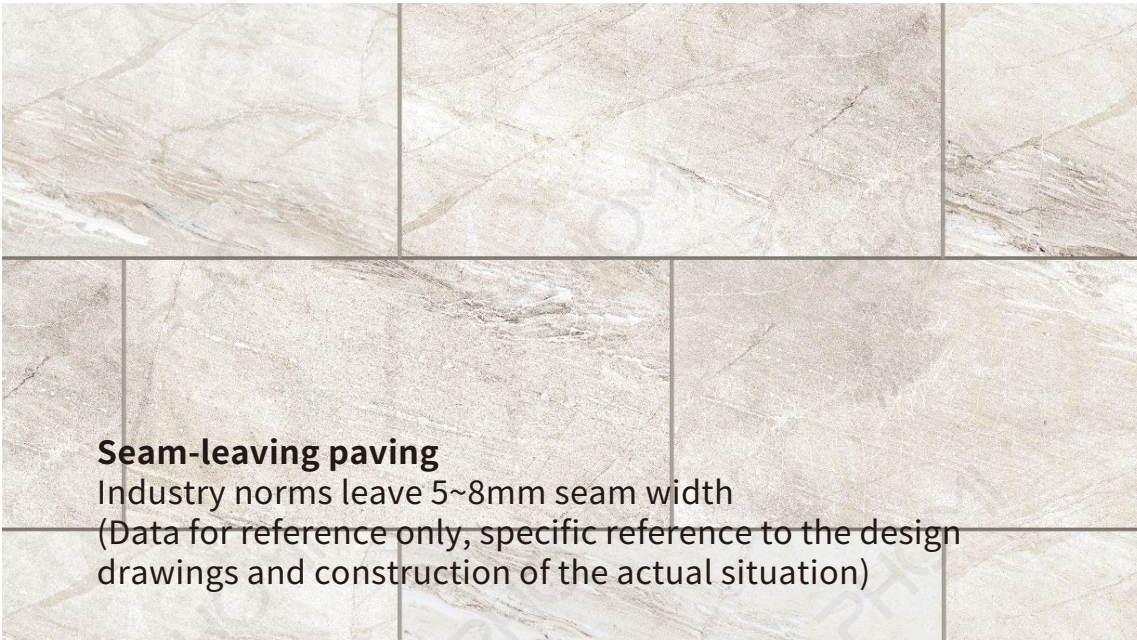


After adjusting the consistency of the seams around the product, pat the Compactionure with a clapper to make the slurry on the back of the product as evenly as possible around it.



>> Seam treatment

Choose the corresponding paving method according to the construction requirements.



Seam-leaving paving



Natural seam paving



- Precautions:
1. Natural concave and convex surface products are mostly close-seam paving (specific reference to the design drawings and construction of the actual situation)
 2. Caulk seam between products with the same colour caulk agent
 3. Special external wall caulking agent should be used for caulking when paving seam-leaving construction and pointing should be done with pointing strips when the caulking agent is semi-dry

>> Outside Corner Treatment

External corner is a construction term, refers to the corner protruding from the wall

Corner brick



1.Corner brick 2.Scrape pulp 3.Paste

Outside Corner passivation treatment



1.Paste masking paper 2.Caulk 3.Grout



4.Tear off masking paper 5.Clean

45° Chamfer



1.Grinding to make 45° chamfer 2.Scraping Paste 3.Paste



4.Compaction

>> Product cutting process

According to the requirements of direct cutting of soft porcelain on site and slotted holes , the product cutting is completed by using suitable cutting tools such as portable cutting machine/track cutting machine/push table inverted saw.



**大型石材板块专用
岩板轨道切割机**
支持无损45°度斜切

倒角 | 开槽 | 磨边 | 直切

产品品牌: 石井	产品型号: 9510
产品名称: 轨道切割机	产品电压: 220v-240v/50hz
锯片转速: 12000r/min	轨道长度: 3.6米 (可加长)
切割长度: 3.2米 (标配)	切割厚度: 2.5cm
轨道包装尺寸: 188x35x30cm	轨道重量: 55KG (净重52KG)
主机包装尺寸: 80x46x34cm	主机重量: 28KG (净重14KG)

安装切割机
调节旋钮
水平泡
刻度标尺
切割底板
靠板 (基准面)
手扶把手

**双标尺
精准度量**
轻松定位

4.3 Finished Product Protection



Protective measures should be taken for the external corners, entrances, passages and other parts that may be damaged during construction.

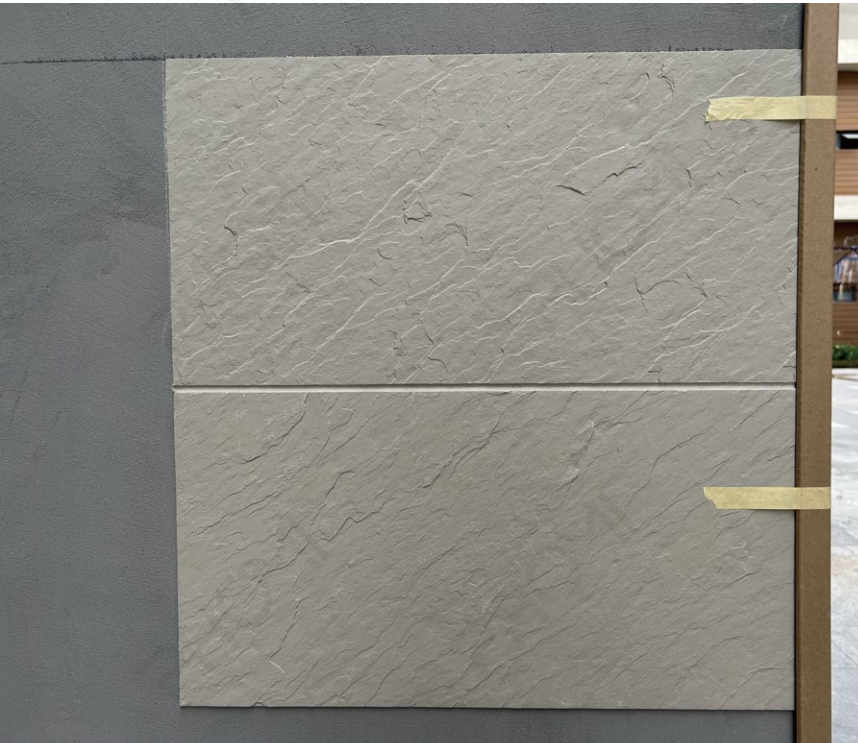


After the construction of the architectural decorative surface engineering is completed, protective measures should be taken for the parts that may cause pollution in the follow-up engineering.

In addition, holes should be repaired with the same batch of sheet material. Rain-proof measures should be taken for outdoor construction products that have been completed, and **rain should be avoided within 48 hours.**

4.4 Quality Acceptance

1.Before paving the external wall decorative surface and during the construction, the sample pieces shall be made on the same base course wall, and the bonding strength of the sample pieces shall be inspected. The bonding strength shall meet the design requirements and shall not be less than 0.2MPa.



Project Case: Economic and Technological Development Zone Shengnuo Park, Liaoning, Shenyang

2.The surface of architectural decorative surface engineering shall be flat, clean, free from pollution, skew, cracks and damage (inspection methods: observation and visual inspection).

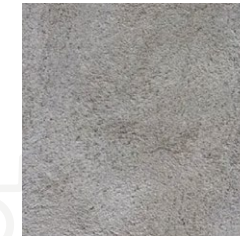
3.Allowable deviation and inspection methods of surface size of architectural decorative surface engineering:

Serial Number	Inspection items	Allowable deviation(mm)		Inspection methods
		External wall	Interior wall	
1	Perpendicularity of facade	3	2	Check with 2m vertical measuring ruler
2	Surface flatness	4	3	Check with 2m guiding rule
3	Seam straightness	4	2	Pull 5m line, less than 5m pull Snap the line for positioning, check with steel ruler
4	Seam height difference	2	1	Check with steel ruler and feeler gauge

Note: concave and convex surface products are only checked for seam straightness according to the requirements of this table, and flatness and perpendicularity are not specified.

Interior Wall Construction

5.1 Base Course Classification



Base course of cement

Ensure that the base course is clean, solid, free of hollows and pollutants. The construction can be started only after there is no water at the base course.



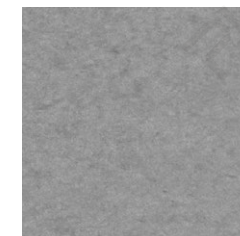
Base course of old tiles

The hollowing, cracking, loosening and peeling parts of the coating should be removed. The polymer cement mortar should be used to repair and level, and the interface agent should be used to interfacial agent the whole base course.



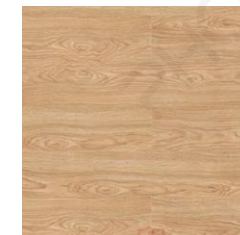
Base course of old paint

Loose coating, hollowing and Pulverization parts parts should be removed, and when putty is not water-resistant, it should be completely removed, and polymer cement mortar should be used to repair and level, and interface agent should be used to roughen the whole base course.



Base course of cement, fiberboard and ETERPAN

Ensure that the base course is clean, solid and free of hollows and pollutants. The construction can be started only after there is no water at the base course.

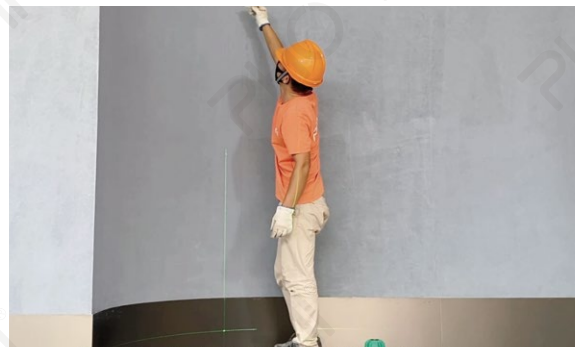


Base course of old solid wood or compound wood

Outdoors should be waterproofed on wood surfaces; indoors can be taped directly.

5.2 Paste Process Demonstration

The case demonstration of pointing and collage



1.Snap line location



2.Scraping Paste



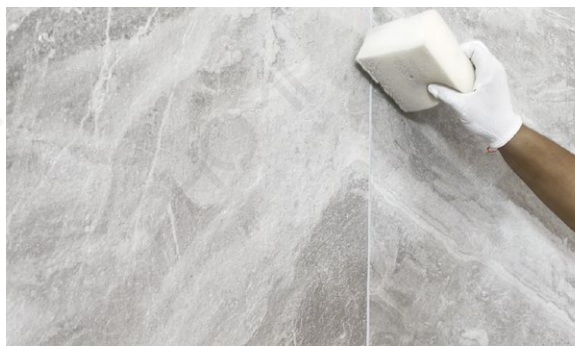
3.Paste



4.Caulk and Grout^[1]



5.External angle treatment^[2]



6.Clean

Annotation:
 [1]See P45 for step-by-step breakdown/detail requirements for caulking and pointing.
 [2]See P47 for step-by-step breakdown/detail requirements for external corners.



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The case demonstration of decorative seam strip



1.Snap line location



2.Stick the metal edge strips in external angle



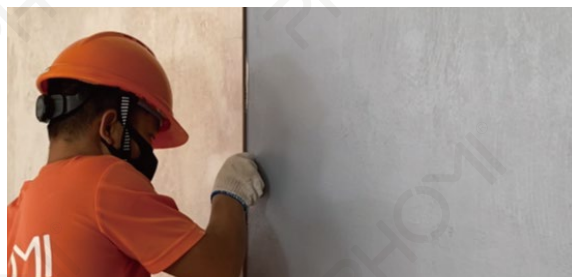
3.Scraping Paste



4.Paste



5.Compaction with board and guiding ruler



6.Install the metal trim strips



7.Paste adjacent products



8.Clean



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Key construction links

>> Snap line positioning links



1.horizontal alignment



2.snap line location

Wall typography (common)



Seamless splicing type



Metal decorative seam type

>> Product Cutting links

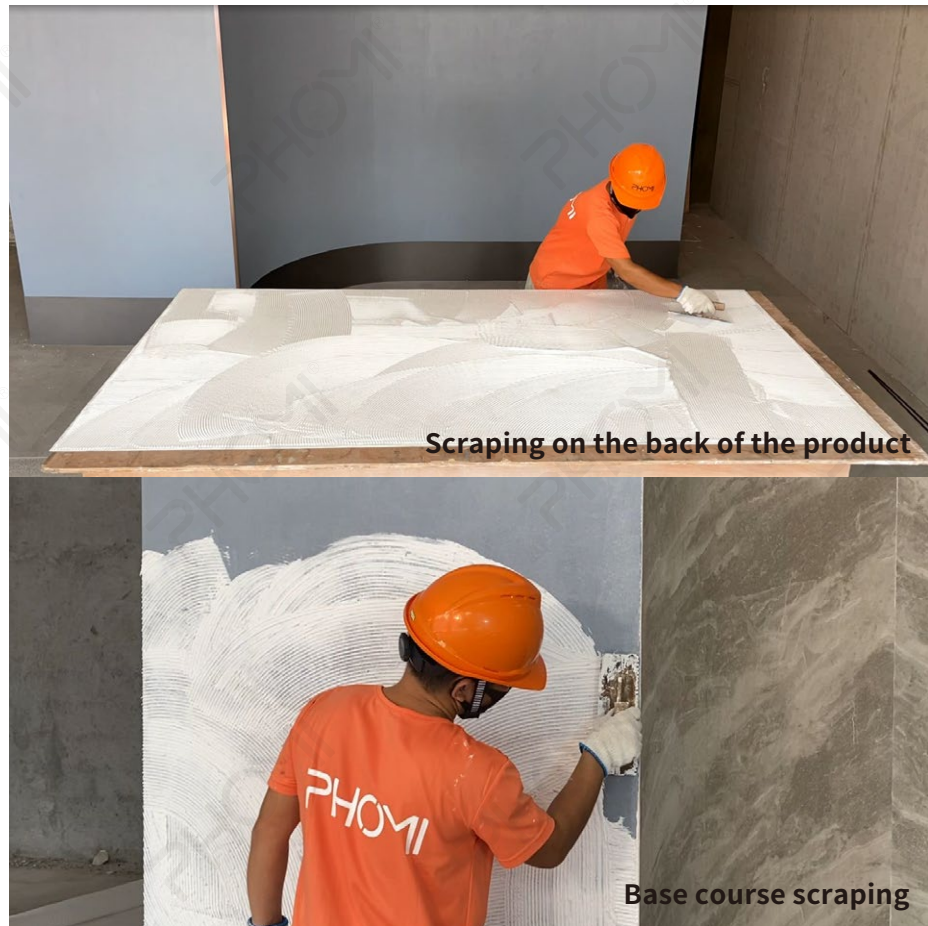
Straight cutting by fence



45 chamfer cutting



>> Scraping paste process



Large-scale products

For scraping the back of the product, the pulp fullness must reach 90% and the pulp thickness is 1-2 mm;
For scraping at the base course, full and uninterrupted serrated stripes should be pulled out.



Small-sized products

The pulp fullness on the back of the product should reach 90% and the pulp thickness should be 1-2mm.



Concave and convex products

Scrape the pulp around the back of the product, and the pulp thickness is 1-2mm.

>> Paste process



1. Two people cooperate tacitly to carry the products.



2. Pave the products along the positioning line



3. Make the pulp on the back of the product as evenly as possible with a board.

>> Seam leaving and sealing treatment process

Seam-leaving paving

Method 1 caulking and pointing:



1. Paste the masking paper along both sides of the seams



2. Caulk the seams with a triangular bag of caulk agent



3. Clean the caulk agent out of the seams with a steel bar or trowel.



4. Tear off the masking paper

Decorative seam strip decoration:



1. After pasting one side of the product, Compaction the decorative seam strip along the edge of the product tightly.



2. Paste the other side of the product along the decorative seam strip.

Close-seam paving



Conventional flat products
Leave a natural seam <0.5mm.



Natural concave and convex surface products
No need to leave a seam

>> Outside Corner Treatment

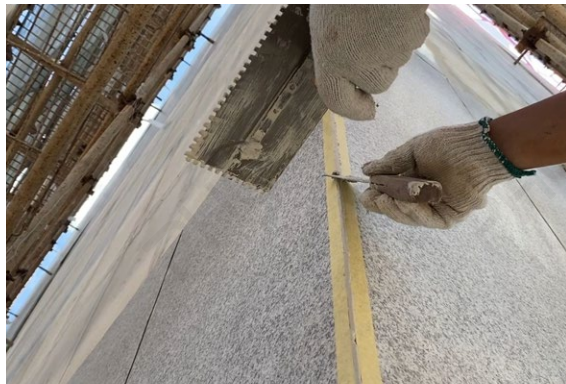
Outside Corner passivation treatment



1. Paste masking paper along the external angle



2. Caulk with a triangle bag of caulk



3. Wait for the caulk to semi-dry to clean the caulk agent out of the seam



4. Tear the masking paper



5. Clean the product surface with a dry sponge

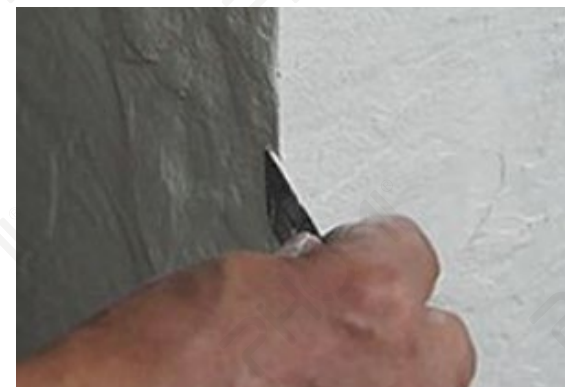
45 Chamfer Repair



1. Grind a 45 bevel angle on the edge of the product with a small grinder (the smaller the bevel angle is during grinding, the easier it is to jump when pasting).



2. When sticking to the corner, the adhesive should be filled, and the two pieces of products should be compacted evenly by hand.



3. If there is a seam in the point, it needs to be repaired tightly with the same color caulking agent.



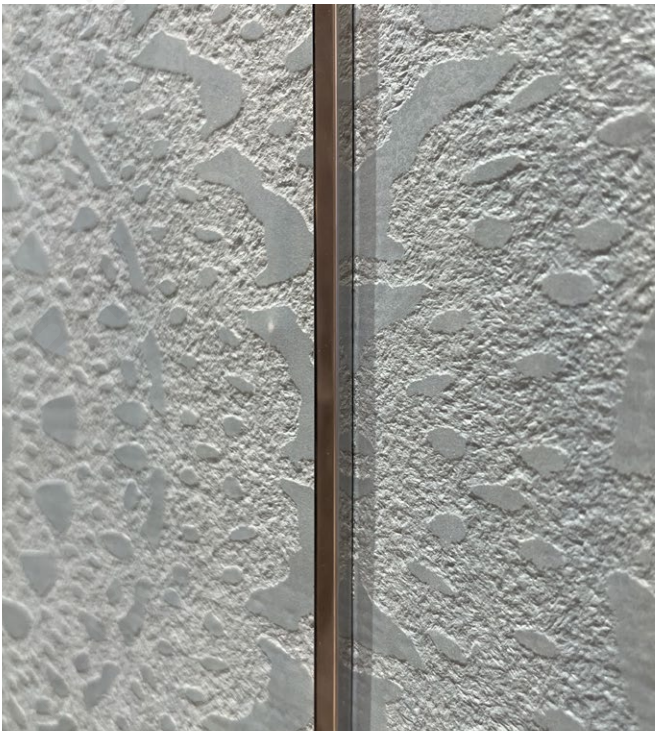
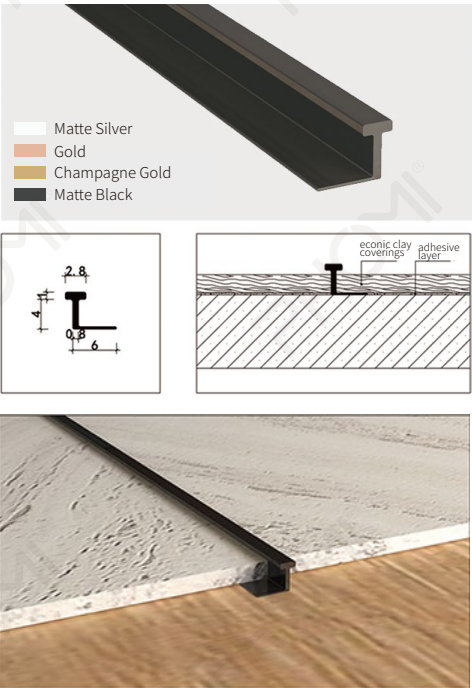
4. After the pulp dries, use a grinding wheel or the same color product to polish the corner to make it smoother.

>> Metal edge process

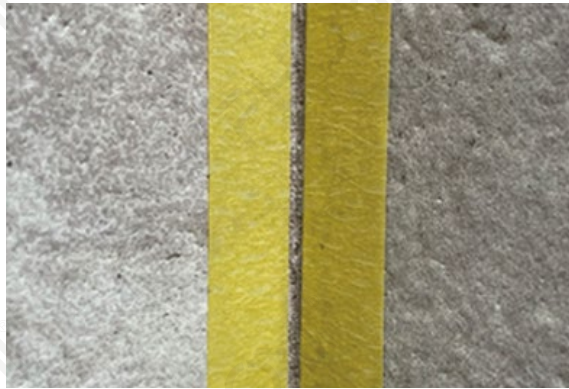
Metal edge trim



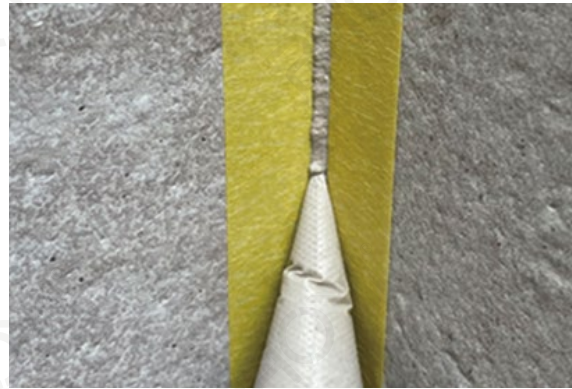
Plain joint metal edge trim



>> Interior angle processing links



1. Stick masking paper



2. Caulk the seams with the same color caulking agent, make sure that all the seams are caulked

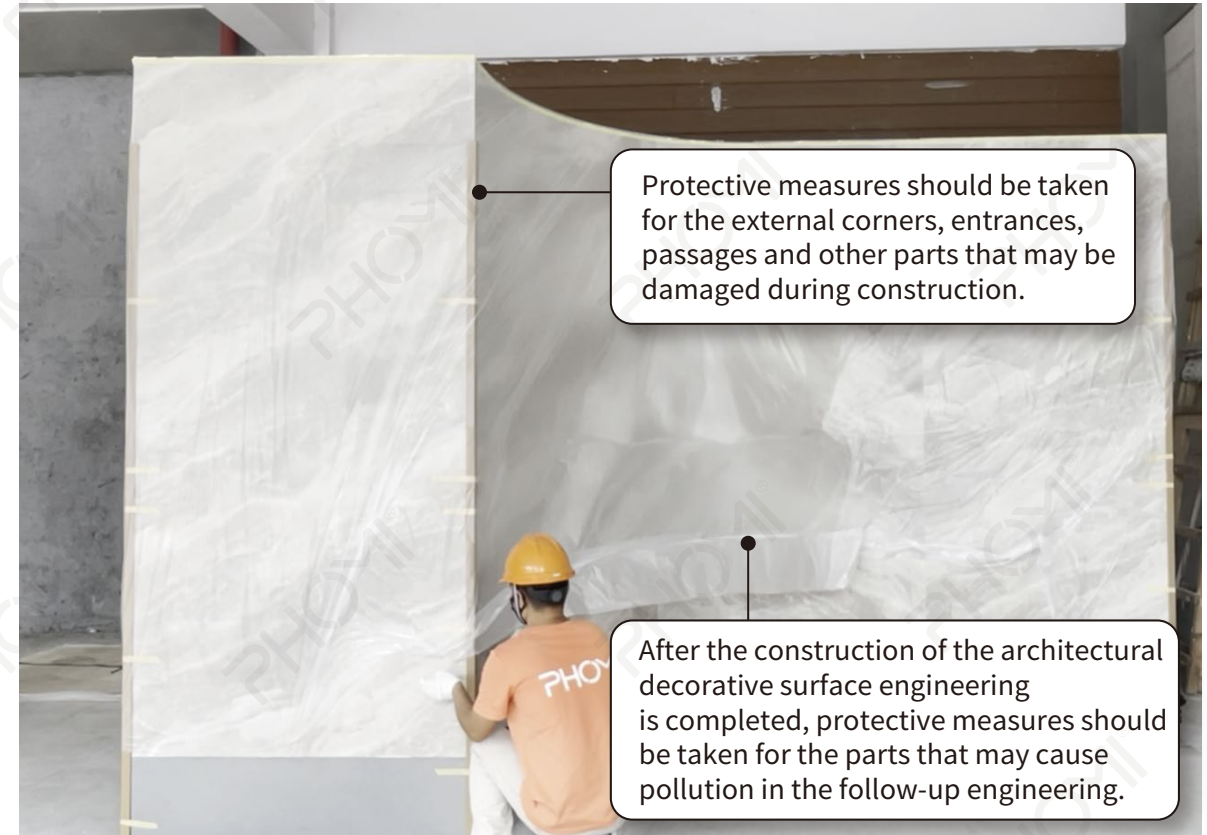


3. When the caulking agent is semi-dry, use the pointing strip with the same seam specification for pointing



4. Tear off the masking paper, and in a semi-dry state, clean the overflow caulking agent with a sponge

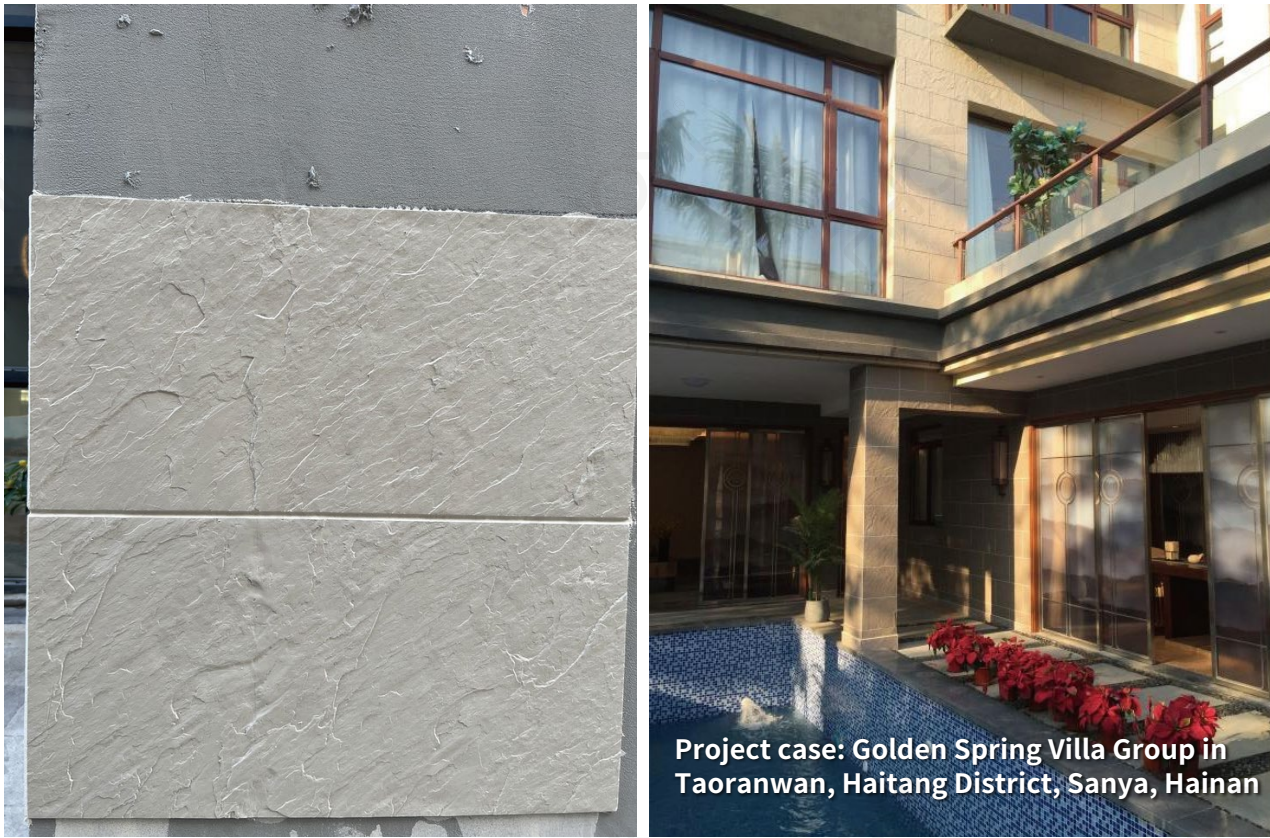
5.3 Finished Product Protection



In addition, holes should be repaired with the same batch of sheet material. Rain-proof measures should be taken for outdoor construction products that have been completed, and rain should be avoided within 48 hours.

5.4 Quality Acceptance

1.Before paving the interior wall decorative surface and during the construction, sample pieces shall be made on the same base course, and the bonding strength of the sample pieces shall be tested. The bonding strength shall meet the design requirements and shall not be less than 0.2MPa.



2.The surface of architectural decorative surface engineering should be flat, clean, free from pollution, skew, cracks and damage (Inspection methods: observation and visual inspection)

3.The allowable deviation and inspection methods of the surface size of architectural decorative surface engineering

Serial Number	Inspection items	Allowable deviation(mm)		Inspection methods
		External wall	Interior wall	
1	Perpendicularity of facade	3	2	Check with 2m vertical measuring ruler
2	Surface flatness	4	3	Check with 2m guiding rule
3	Seam straightness	4	2	Pull 5m line, less than 5m pull Snap the line for positioning, check with steel ruler
4	Seam height difference	2	1	Check with steel ruler and feeler gauge

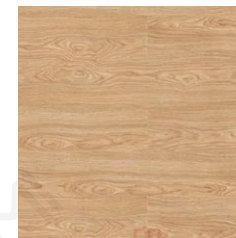
Note: concave and convex surface products are only checked for seam straightness according to the requirements of this table, and flatness and perpendicularity are not specified.

6.1 Base Course Classification



Base course of cement

Ensure that the base course is clean, solid, free of hollows and pollutants. The construction can be started only after there is no water at the base course.

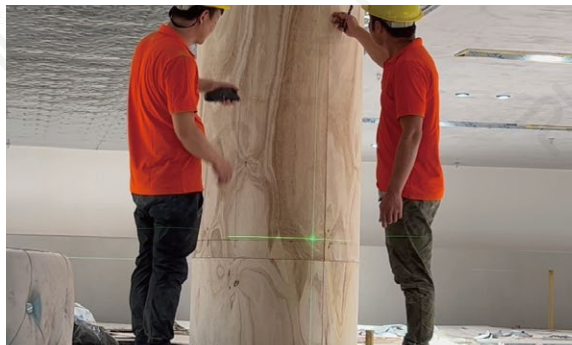


Base course of old solid wood or compound wood

Outdoors should be waterproofed on wood surfaces; indoors can be taped directly.

Cylindrical and Curved Construction

6.2 Paste Process Demonstration



1.Snap line location



2.Scraping pulp



3.Paste



4.Caulk



5.Grout

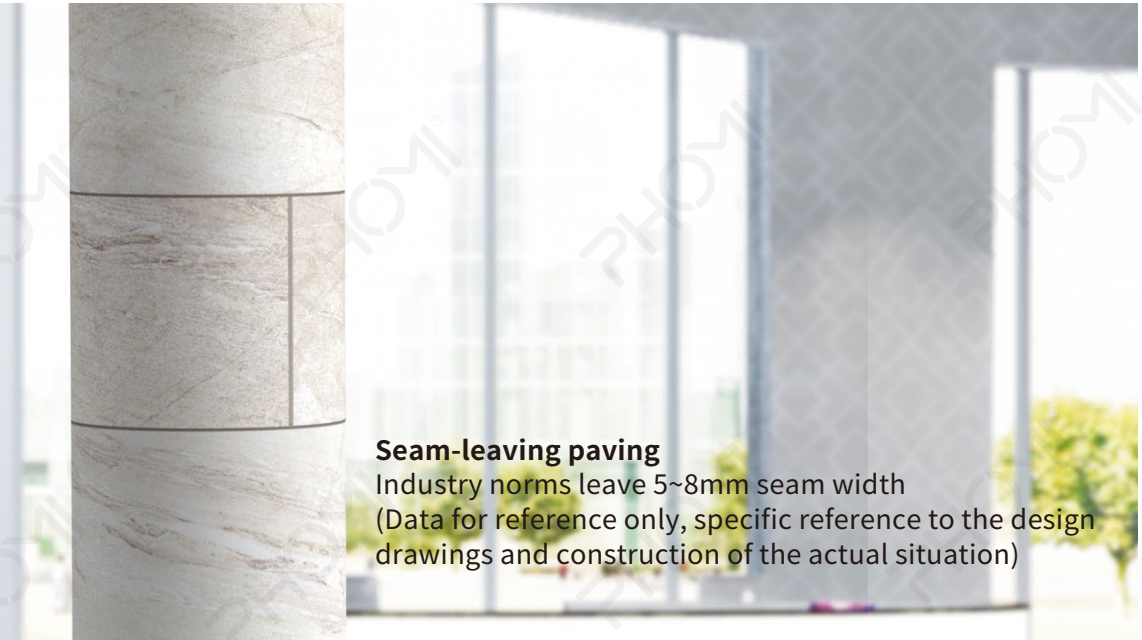


6.Clean

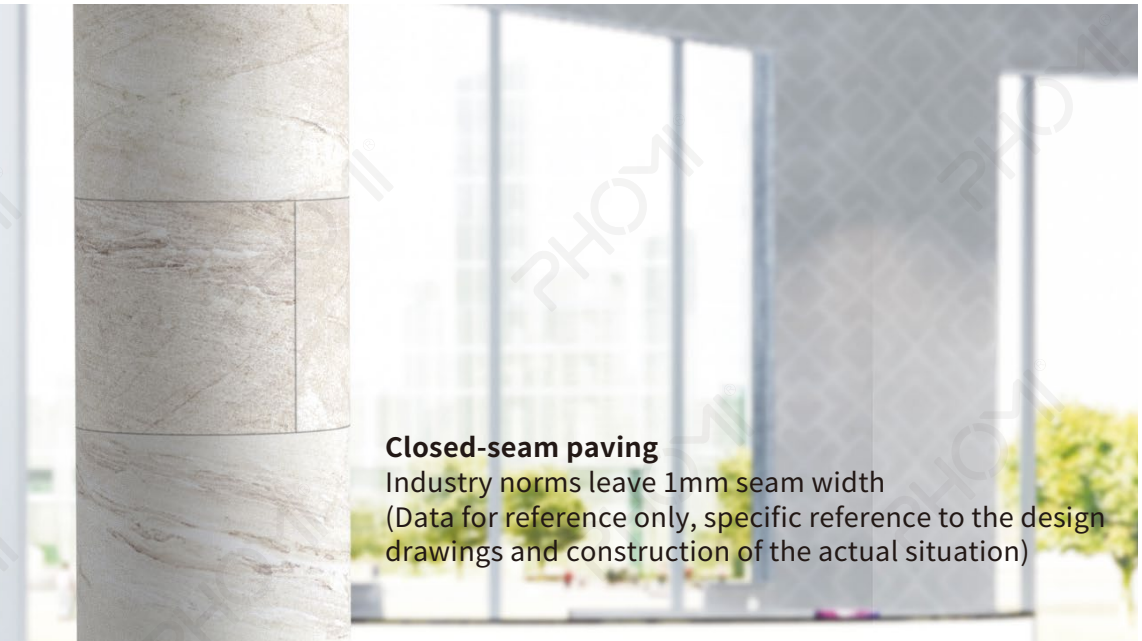
*For more construction operation details, please refer to P58.

Key construction links

>> Seam treatment



Seam-leaving paving
Industry norms leave 5~8mm seam width
(Data for reference only, specific reference to the design drawings and construction of the actual situation)



Closed-seam paving
Industry norms leave 1mm seam width
(Data for reference only, specific reference to the design drawings and construction of the actual situation)

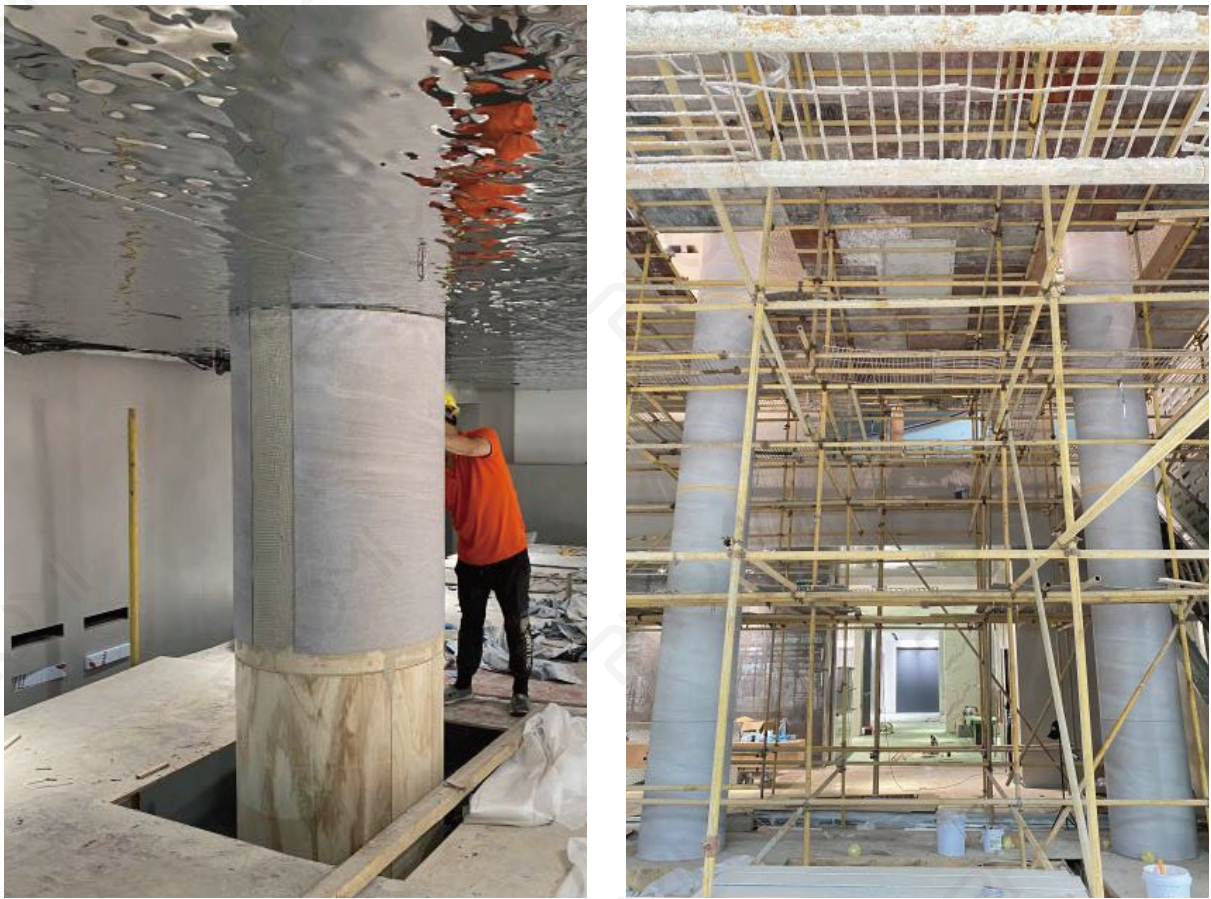
- Precautions:
1. Natural concave and convex surface products are mostly close-seam paving (specific reference to the design drawings and construction of the actual situation)
 2. Caulk seam between products with the same colour caulk agent
 3. Special caulking agent should be used for caulking when paving seam-leaving construction and pointing should be done with pointing strips when the caulking agent is semi-dry
 4. Stick masking paper,pointing with appropriate steel bars and then tear off masking paper before seam-leaving paving and pointing

6.3 Finished Product Protection



After the completion of paving, protective measures should be taken for the parts that may cause pollution in subsequent projects; outdoor construction of finished products should be taken to prevent rain measures.

6.4 Quality Acceptance



- 1.Before the shop is stuck and in the process of construction, shall be made on the same base sample.
- 2.The surface of architectural decorative surface engineering should be smooth, clean, no pollution, no skew, no cracks and damage. (Inspection methods: observation and visual inspection)

7.1 Base Course Classification



Base course of cement

Ensure that the base course is clean, solid, free of hollows and pollutants. The construction can be started only after there is no water at the base course.



Base course of old tiles

The hollowing, cracking, loosening and peeling parts of the facing layer should be removed. The polymer cement mortar should be used to repair and level, and the interface agent should be used to interfacial agent the whole base course.

Floor Construction

7.2 Paste Process Demonstration



1.Snap line location



2.Scraping Paste



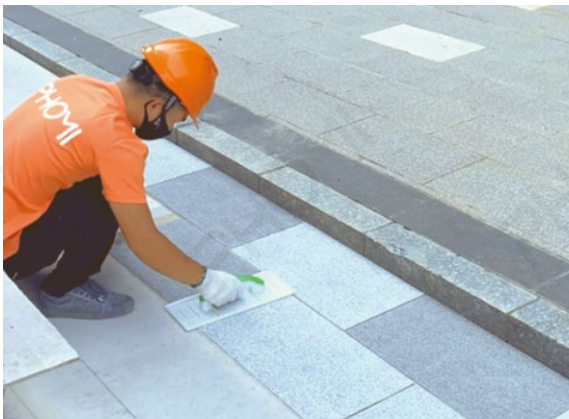
7.Clean



8.Brush floor special coating agent



3.Paste



4.Compaction



9.Take protective measures



5.Caulk



6.Grout

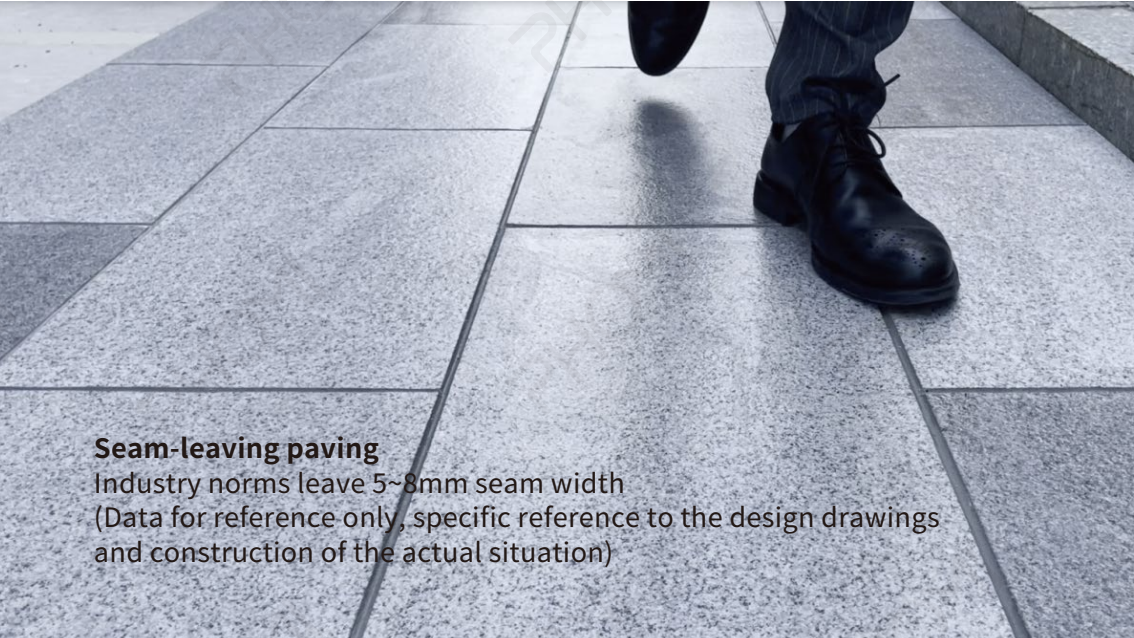
*For more construction operation details, please refer to P65.



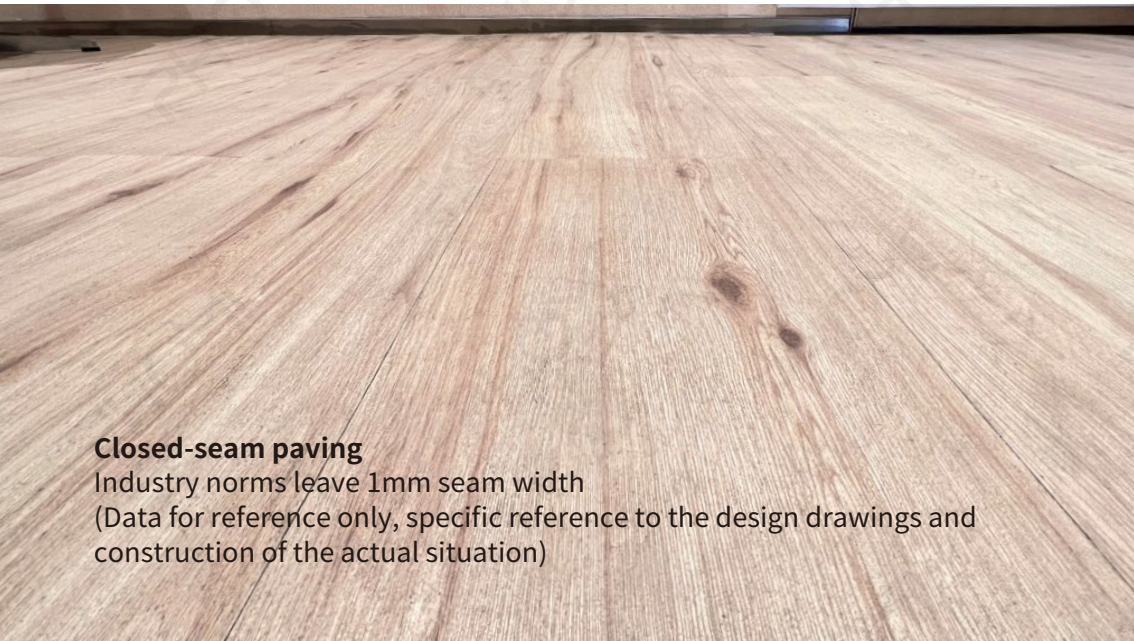
Scan code to watch
construction video
tutorial

Key construction links

>> Seam treatment



Seam-leaving paving
Industry norms leave 5~8mm seam width
(Data for reference only, specific reference to the design drawings and construction of the actual situation)



Closed-seam paving
Industry norms leave 1mm seam width
(Data for reference only, specific reference to the design drawings and construction of the actual situation)

Precautions:

1. Natural concave and convex surface and wood series products are mostly close-seam paving (specific reference to the design drawings and construction of the actual situation)
2. Caulk seam between products with the same colour caulk agent
3. Stick masking paper, pointing with appropriate steel bars and then tear off
4. Special caulking agent should be used for caulking when paving seam-leaving construction and pointing should be done with pointing strips when the caulking agent is semi-dry

7.3 Finished Product Protection



Brush floor special coating agent



Take protective measures

1. After paving is completed, before the adhesive and caulking agent are fully cured, protective measures should be taken to prevent rain, sun exposure, collision, scratching and pollution.
2. Reasonable arrangements for water, electricity, equipment installation and other processes to avoid opening holes after completion. If it is necessary to open the hole, should wait for the curing of adhesive.

7.4 Quality Acceptance

1.The slope of the ground surface should meet the design requirements, and there should be no flooding or water accumulation; The point with floor drain and pipe-line should be tight and firm, without leakage. (Inspection method: observation, water splashing or slope scale and water storage inspection)

2.The allowable deviation and inspection methods of the surface size of floor decorative engineering

Serial Number	Inspection items	Allowable deviation(mm)		Inspection methods
		Flat Series	Unevenness Series	
1	Surface flatness	2.0	10.0	Check with 2m guiding ruler and wedge ruler
2	Seam straightness	3.0	8.0	Pull 5m line, less than 5m pull Snap the line for positioning, check with steel ruler
3	Seam height difference	1.5	/	Check with straight steel ruler and wedge feeler gauge
4	Skirting straightness	3.0	/	Pull 5m line, less than 5m pull Snap the line for positioning, check with steel ruler

Note: concave and convex surface products are only checked for seam straightness according to the requirements of this table, and flatness and perpendicularity are not specified.