

Qingdao Achieving Honeycomb Panel Co., Ltd.

青 岛 智 新 成 复 合 板 材 有 限 公 司

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Structural Substrate Solutions for Ultra-Thin Translucent Stone Composites

- **Client Profile & Main Requirements**

Client Profile: A premier architectural stone processor and luxury marble project provider specializing in high-end surface solutions.

Core Business: Deep processing and system integration of rare luxury stones, including translucent gemstone feature walls, artistic backlit ceilings, and large-span panoramic decorative stone installations for 5-star hospitality and luxury private residences.



- **Technical Challenges & Industry Pain Points**

In contemporary spatial design, the application of natural translucent stone is inherently constrained by the physical limits of the material, presenting three major bottlenecks for contractors and fabricators:

High Brittleness & Catastrophic Breakage: To achieve optimal light transmission, natural stone must be calibrated down to 3–5 mm. At this thickness, its flexural strength drops drastically. Micro-cracking, chipping, and catastrophic breakage frequently occur during cross-border sea freight, secondary handling, and on-site cutting, resulting in low yield rates and unexpected replacement costs.

Dead Load Risk in High-Altitude Installation: Traditional translucent panels rely on thick glass or heavy resin substrates. This massive dead load creates stringent demands on the load-bearing capacity of structural steel frameworks and anti-drop anchoring systems during large-scale high-ceiling installations, prolonged construction cycles, and long-term liability risks.

Backlit Shadowing & Visual Defects: Minor thickness variations in traditional backing materials lead to uneven light diffusion. When backlit by LED arrays, these variations manifest as localized dark spots or shadows, ruining the premium texture of luxury gemstones.

Technical solution engineered by R&D Department
at Qingdao Achieving Honeycomb Co., Ltd. 2026.

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• Our Engineered Technical Solution

To address these critical performance metrics, **Qingdao Achieving Honeycomb** offers a dual-engineered approach combining macromolecular materials engineering with high-precision surface processing.

I. 100% Virgin Polypropylene (PP) Honeycomb Substrate

Guaranteed 100% Virgin Resin: We strictly utilize high-purity, virgin PP resin with zero recycled material content. This guarantees outstanding long-term weather resistance, non-yellowing characteristics under backlit heat, and prevents premature aging or embrittlement.

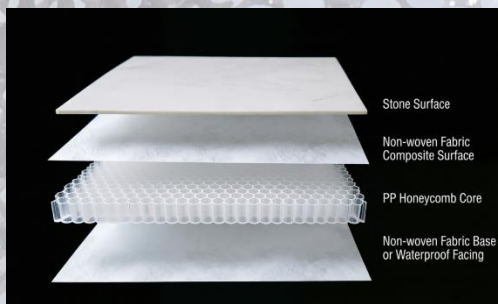
Thermal-Bonded Non-Woven Fabric Interface: A specialized high-polymer non-woven fabric is thermally fused to the circular honeycomb core. This structure creates a high-strength dual "**mechanical anchoring + chemical bonding**" interface when combined with stone adhesives (e.g., epoxy), completely eliminating the risk of delamination or peeling under thermal expansion.

II. High-Precision CNC Flatness Control System

Ultra-Low Thickness Tolerances: Utilizing custom multi-axis CNC leveling equipment, we control the thickness tolerance of our honeycomb panels within **Approx.0.2 mm**. This absolute uniformity ensures an even distance between the light source and the stone layer, eliminating localized backlit shadows.

III. Dynamic Customization Matrix

Based on the application (static accent walls vs. dynamic suspended ceilings vs. high-vibration elevator cars), we adjust the cell core size (typically 8mm to 12mm) and node skin thickness to achieve the ideal equilibrium between weight reduction and structural impact resistance.



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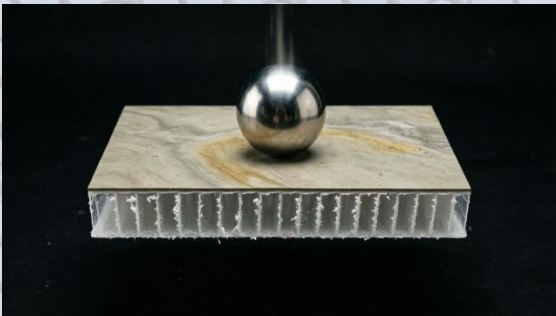
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• Design Intent & Performance Advantages (Physics Breakdown)

Feature	Traditional Translucent Panels (Glass/Resin Base)	Our Solution (Ultra-Thin Stone + 100% Virgin PP Honeycomb)
Dead Load Control	Heavy (Approx.60–70 kg/m²), demands heavy channel-steel frameworks.	Ultra-lightweight (Approx.10–15 kg/m²), compatible with light aluminum keels.
Acoustic & Thermal Insulation	Poor thermal properties; solid mass transmits structural sound.	Hollow cellular structure dampens sound and blocks heat from LED matrices.
Stress Dispersion	Brittle; micro-settlement of buildings translates directly to stone cracking.	Elastic toughness absorbs seismic stress, thermal expansion, and contraction.

Drastic Logistics & Labor Savings: The ultra-lightweight structure allows large-span panels to be safely carried and positioned by just two on-site installers without renting expensive heavy hoisting machinery, significantly cutting international freight and handling costs.

Unlocking Design Scale: By mitigating the fragility of thin stone, this substrate enables architects to confidently implement oversized formats, floor-to-ceiling single panels, and seamless book-matched splicing without structural weight limitations.



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• **Proven Results: Comparative Performance Data**

Following real-world deployments in luxury hotel lobbies and premium residential projects, clients report disruptive engineering and financial benefits:

Evaluation Metric	Traditional Full-Thickness Marble Slab	Marble-PP Honeycomb Composite Panel	Performance & Profit Margin Improvement
Raw Stone Material Yield	Full thickness (Approx.20–30 mm)	Ultra-thin surface (Approx.3–5 mm)	Saves up to 80% of precious raw luxury stone consumption per project.
Finished Structural Weight	Approx. 60–70 kg/m ²	Approx. 10–15 kg/m ²	Reduces dead load by Approx.80% , lowering structural framework costs.
Logistics Breakage Rate	High risk (Approx.12% average on long-haul)	Well under 1%	Significantly increases overall project yield and fabricator net profit margins.

Buyer Testimonial from the Field

"By integrating this virgin polypropylene honeycomb composite technology, we successfully delivered a seamless, large-scale backlit luxury marble wall for a 5-star hotel lobby project. Not only did it eliminate our structural safety concerns regarding overhead panel weights, but it also directly slashed our raw stone procurement costs and accelerated on-site installation by 40%. It's a standard-defining upgrade for translucent stone engineering."



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Polypropylene Honeycomb “P8T40” Non woven

SPECIFICATION			
Dimensions	standard : 1220 x 2440 mm	export : 1150 x 2300 mm	
Thickness	5-100mm or customized		
Cell size	8mm		
Density without facing	80kg/m ²		
Color	white		
Coating	nature	weight	
Non-woven	Polyester	40g/m ²	
Possible process	RTM, closed moulds		
CHARACTERISTICS			
Properties	Test method	PP8T40	
Flatwise tensile 	ASTM C 297	Typical Strength psi/Mpa	130/0.89
Bare compression 	ASTM C 365	Typical Strength psi/Mpa	275/1.89
		Typical Modulus ksi/Mpa	11.5/79.2
Plate Shear 	ASTM C 273	Typical Strength psi/Mpa	85/0.58
		Typical Modulus ksi/Mpa	2.2/15.2
Water resistance,% retention of shear strength - 20°C	ASTM C393	±100%**	
Heat resistance for honeycombs core THK 20mm	R=0.3m ² .°C/W (soitλ=0.067W/(m.°C)		
Heat resistance for honeycombs core THK 90mm	R=0.6m ² .°C/W (soitλ=0.014W/(m.°C)		
Behaviour with fire	Standard quality inflammable, Possibility of M1/F0 classification for finished sandwich panels, depending on the sandwich skin		
Chemical Properties	Excellent resistance to water and most acids, bases and salt solutions		
Resistance to Ultraviolet rays(U.V.)	The longevity for the core's storage is guaranteed by a anti U.V.-U.V. protection of the finished panel is ensured by the skins of the sandwich panel		
Shocks resistance	Increased by the use of pp honeycomb		

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