

Qingdao Achieving Honeycomb Panel Co., Ltd.

青 岛 智 新 成 复 合 板 材 有 限 公 司

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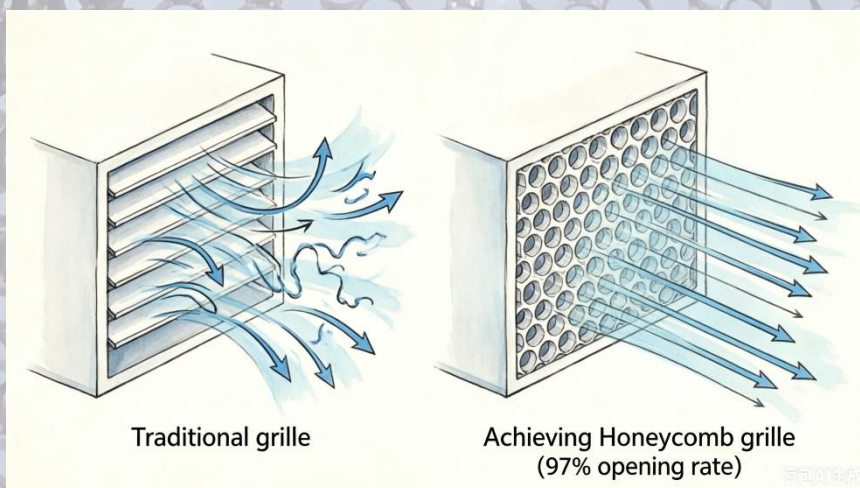
Advanced Air Flow Straighteners: Precision Laminar Flow & Anti-Frost Engineering

• Introduction

Introduction In precision HVAC systems and commercial cold chain applications, airflow turbulence and frost formation are the primary drivers of energy inefficiency. Utilizing advanced Polycarbonate (PC) honeycomb technology, our industrial-grade Air Flow Straighteners are engineered specifically to eliminate these pain points. By converting chaotic turbulence into stable, parallel laminar flow, our core structures achieve an open area of up to 97%, maximizing air throw distance while maintaining an ultra-low pressure drop. For high-humidity environments, our Anti-Frost Solutions leverage the inherently low thermal conductivity of 100% virgin PC to eliminate thermal bridging and significantly delay ice propagation. Whether stabilizing air curtains in commercial display cases or optimizing industrial air distribution, we deliver precision engineering that meets the most stringent thermal management and food safety compliance standards.

1. Laminar Flow Engineering

Conventional grilles often induce turbulent eddies, resulting in localized temperature gradients. Featuring a micro-aperture structure with up to 97% open area, our honeycombs utilize an optimized aspect ratio (cell depth to diameter) to mechanically redirect turbulent airflow into uniform, parallel laminar flow. This significantly extends air throw, ensures a homogeneous thermal zone, and reduces fan power consumption.



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

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2. Laminar Flow Optimization for Air Curtains

The energy efficiency of commercial display cases hinges on air curtain stability. Our honeycomb matrices instantly transform turbulent intake into highly parallel laminar flow streams. By optimizing the fluid dynamics and lowering the Reynolds number, the air curtain remains rigid and unbroken even during door openings or in open-front configurations, effectively blocking ambient heat ingress.



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3. Thermal Bridging Prevention & Anti-Frost Performance

Unlike traditional aluminum or metal grilles, high-performance Polycarbonate (PC) exhibits exceptionally low thermal conductivity, inherently preventing the formation of "thermal bridges." In low-temperature, high-humidity cryogenic environments, this thermal resistance—combined with a smooth, hydrophobic surface—significantly retards condensate accumulation and ice propagation. For end-users, this translates to fewer defrost cycles, zero refrigeration efficiency decay caused by frost clogging, and consistently clear product visibility.

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4. Stringent Hygiene & Regulatory Compliance

The inner cell walls feature a seamless, monolithic extrusion profile that resists grease, dust adhesion, and particulate accumulation, effectively eliminating microbial harborage. Capable of withstanding high-pressure washdowns and aggressive chemical sanitation, our products fully satisfy the stringent hygiene requirements of HACCP and food safety management systems.

5. Customized Flow Direction

To accommodate specialized angular or lateral air distribution requirements, we offer precision angular cutting (e.g., 45° or 60° cell inclinations) and size, thickness customize. This allows for direct, targeted airflow positioning without the added weight, cost, or pressure drop of secondary external deflector vanes.

6. 100% Closed-Loop Recyclability

As a premium thermoplastic engineering resin, polycarbonate offers exceptional closed-loop recycling potential. At the end of its operational lifecycle, our honeycomb structures can be fully shredded and re-granulated into raw feedstocks for other industrial applications. This drastically mitigates industrial waste directed to landfills, aligning your supply chain with global Circular Economy initiatives.

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7. Carbon Footprint Advantages of Virgin Material

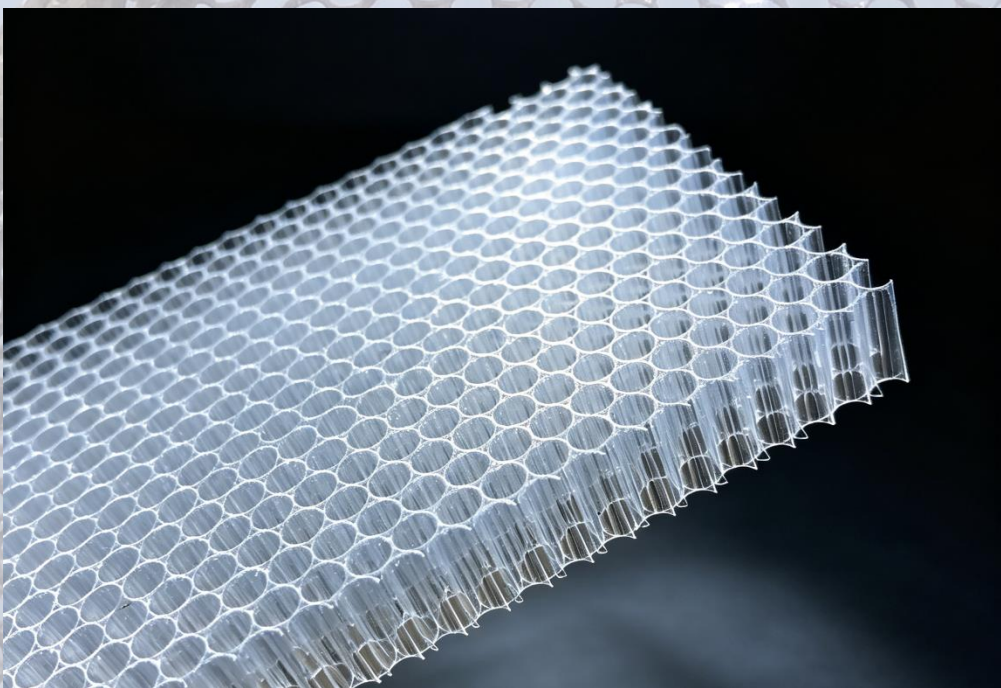
Compared to recycled resins bound with impurities, components extruded from 100% virgin PC grade stock deliver a far superior strength-to-weight ratio. This engineering advantage allows for down-gauging—achieving the same structural integrity with less material mass. Furthermore, its extended operational lifespan eliminates the frequent replacement cycles, reducing downstream resource consumption and cumulative carbon emissions.

8. Zero-VOC & Non-Toxic Commitment

Our proprietary manufacturing process is completely free of harmful plasticizers or volatile organic solvents. Fully compliant with **RoHS** directives, the material guarantees zero toxic outgassing (**Zero-VOC**), even under rapid thermal cycling or within sealed enclosures such as commercial refrigerators and cleanrooms, safeguarding both food products and ambient air quality.

9. Accelerating Carbon Neutrality Goals

By delivering a lightweight structural profile and substantially boosting the Energy Efficiency Ratio (EER) of terminal equipment—such as refrigeration units and AHUs (Air Handling Units)—our technology directly lowers the operational carbon footprint of end-users, serving as a critical asset for corporate Scope 3 emission reductions and carbon neutrality targets.



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Polycarbonate Honeycomb “PC3.5”

SPECIFICATION		
Dimensions	standard: 1220 x 2440 mm	export: 1150 x 2300 mm
Thickness	2.2-1000mm or customized	
Cell size	3.5mm	
color	transparent/black/grey	
Style	Material	Density
PC3.5	Polycarbonate	90kg/m²
Possible process	RTM, closed moulds	
CHARACTERISTICS		
Properties		data
Typical Bare Compressive	Strength Mpa	2.2
	Mudulus Mpa	115
Typical Plate Shear	Strength Mpa	1.3
	Mudulus Mpa	22
CAUTION		
Behaviour with fire	Flame retardant level 2, i.e. B2 level. The ignition point of the PC board itself is 580 °C, and it will self extinguish after leaving the fire. It does not produce toxic gases during combustion and will not promote the spread of the fire.	
Chemical Properties	Excellent resistance to water and most acids, bases, and salt solutions, good heat and cold resistance.	
Weather ability	The heat resistant temperature range of PC material is -45℃-135℃. At -30℃ does not occur cold brittle, at 120℃ does not soften, in the harsh environment of its mechanics, mechanical properties have no significant change.	
Light transmittance	Transparent honeycomb panel transmittance of up to 90%.	

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Polycarbonate Honeycomb “PC6”

SPECIFICATION		
Dimensions	standard: 1220 x 2440 mm	export: 1150 x 2300 mm
Thickness	2.2-1000mm or customized	
Cell size	6mm	
color	transparent/black/grey	
Style	Material	Density
PC6	Polycarbonate	80kg/m²
Possible process	RTM, closed moulds	
CHARACTERISTICS		
Properties		data
Typical Bare Compressive	Strength Mpa	1.6
	Mudulus Mpa	95
Typical Plate Shear	Strength Mpa	0.5
	Mudulus Mpa	19
CAUTION		
Behaviour with fire	Flame retardant level 2, i.e. B2 level. The ignition point of the PC board itself is 580 °C, and it will self extinguish after leaving the fire. It does not produce toxic gases during combustion and will not promote the spread of the fire.	
Chemical Properties	Excellent resistance to water and most acids, bases, and salt solutions, good heat and cold resistance.	
Weather ability	The heat resistant temperature range of PC material is -45℃-135℃. At -30℃ does not occur cold brittle, at 120℃ does not soften, in the harsh environment of its mechanics, mechanical properties have no significant change.	
Light transmittance	Transparent honeycomb panel transmittance of up to 90%.	

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