



‘Comfort Where It Matters’

**Displacement ventilation delivering calm, clean air
in gyms and emergency shelters**

Fresh Cool®



Fresh Cool[®] addresses these challenges with displacement ventilation

Challenges of Gymnasium Air Conditioning / Challenges as Emergency Shelters

- 1. Heat stress in summer, cold floors in winter**
- 2. Airflow that disrupts sports performance**
- 3. Growing consumption**
- 4. Ventilation and infection control**
- 5. Readiness for use as emergency shelters**

Displacement Ventilation System

Displacement ventilation systems deliver fresh, conditioned air gently from the floor level, allowing heat and contaminants to rise naturally and be exhausted upward. This creates a comfortable, well-balanced indoor environment where fresh air fills the occupied zone efficiently, even in large-scale spaces.

By minimizing temperature stratification and unnecessary air mixing, the system provides superior comfort while significantly reducing energy consumption—making it an ideal air-conditioning solution for gymnasiums and other large facilities.



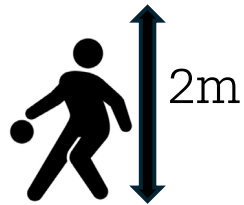
Game-Ready Breeze

“Experience a Breeze Without Distraction.”

Our cooling system features countless micro-outlets that deliver a gentle, low-speed airflow—keeping the environment cool without disturbing your game. Even precision sports like badminton stay perfectly calm, so you can focus on winning.



Cool and heat only where you are



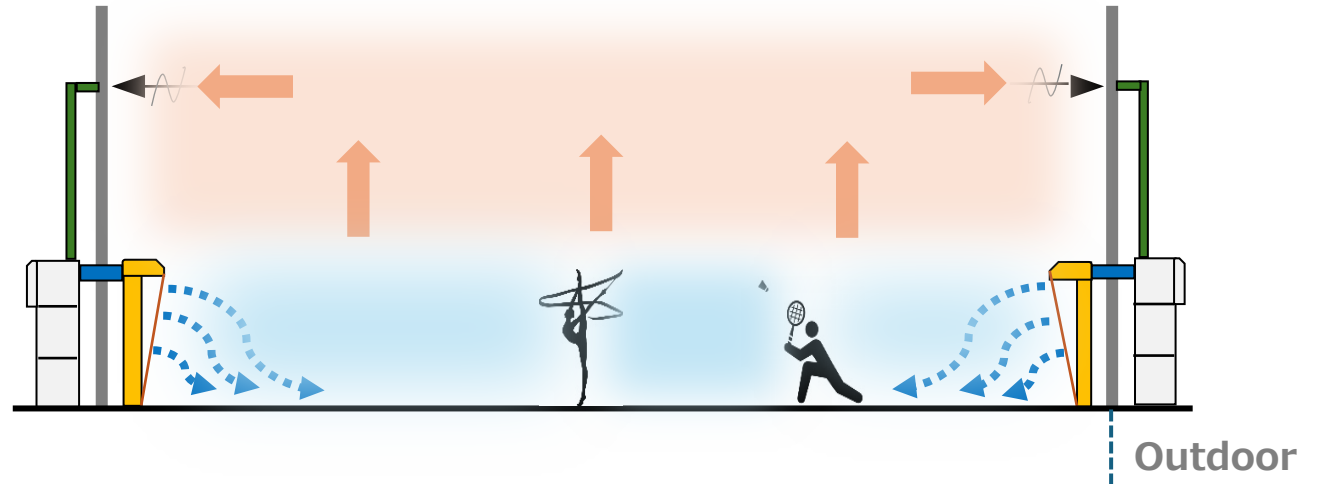
Fresh Cool® efficiently conditions only the occupied zone—up to 2 meters above the floor, where people live and move.

Advanced airflow control pushes heat and stagnant air upward for exhaust, delivering superior cooling performance.

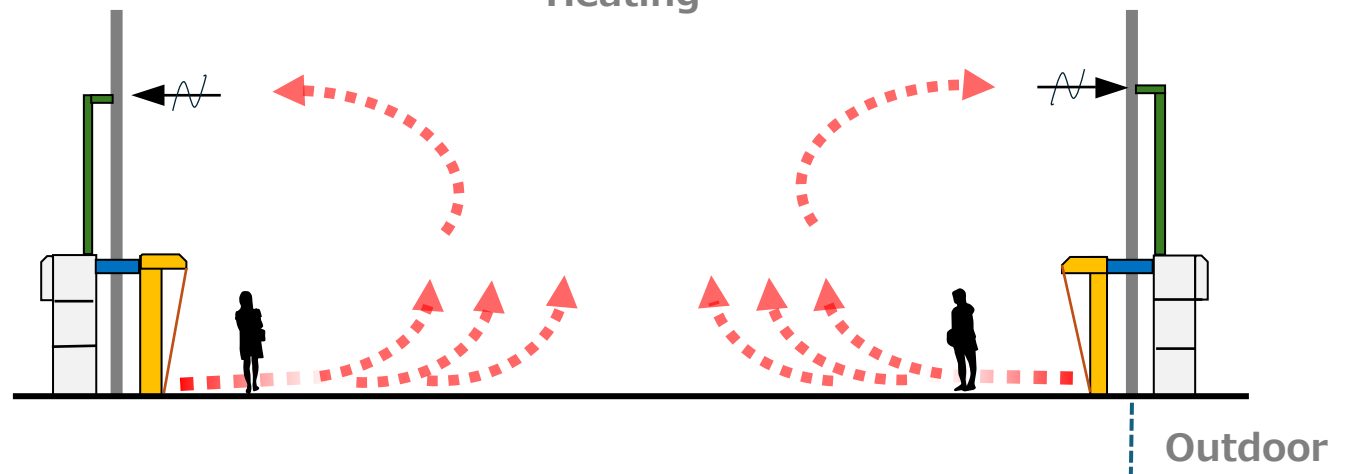
During heating operation, high-temperature, high-velocity warm air is supplied near the floor, gently warming the space from the ground up.

Because the system operates on 100% outdoor air and exhausts all supplied air, no additional ventilation equipment or window opening is required.

Cooling



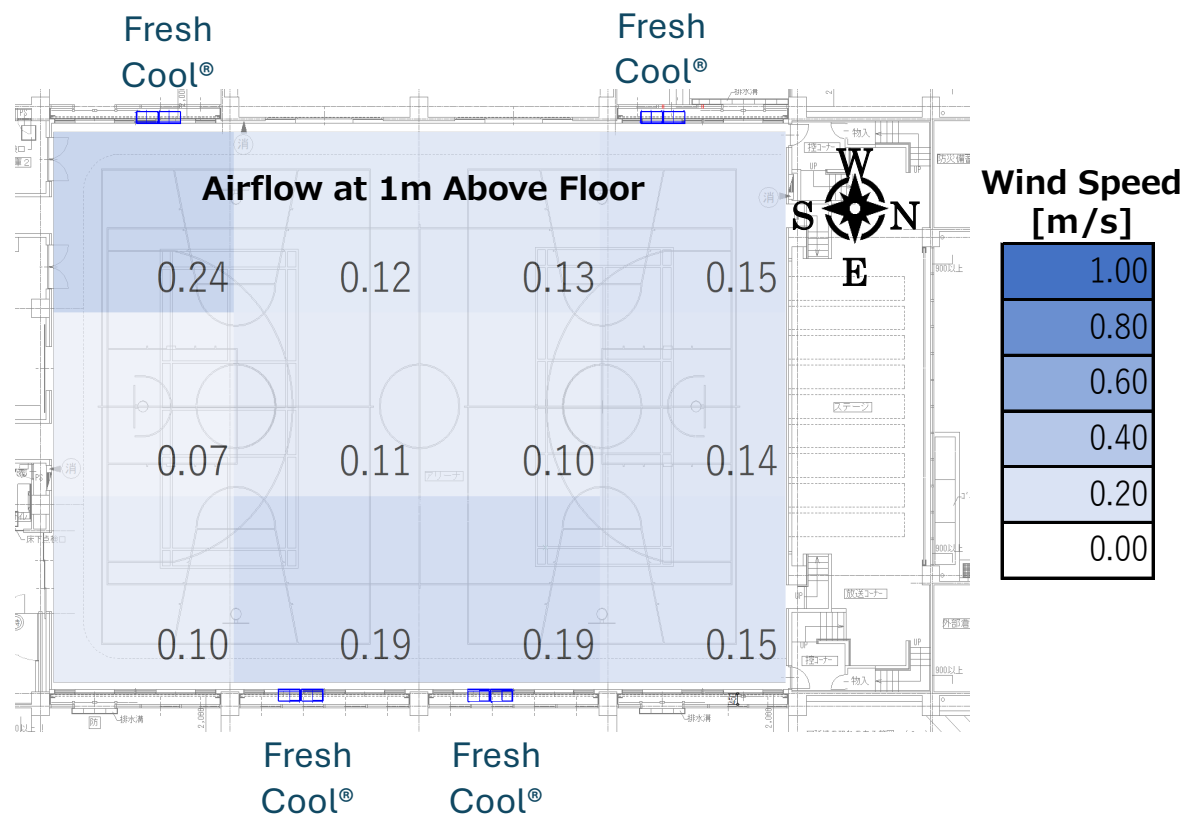
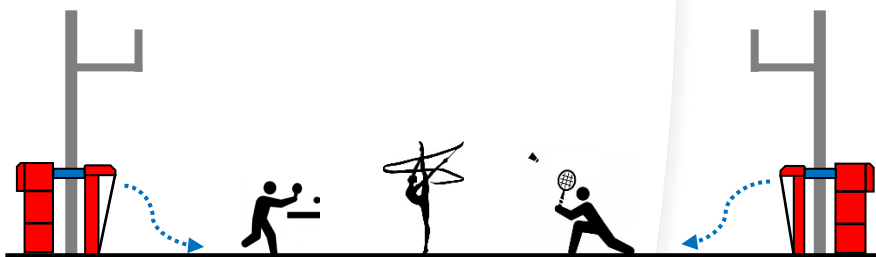
Heating



Play without disruption

Cooling

Stable indoor airflow – average speed below 0.2 m/s. No impact on shuttlecocks, ping-pong balls and ribbons. Stay right on target.



Average Wind Speed : 0.14m/s

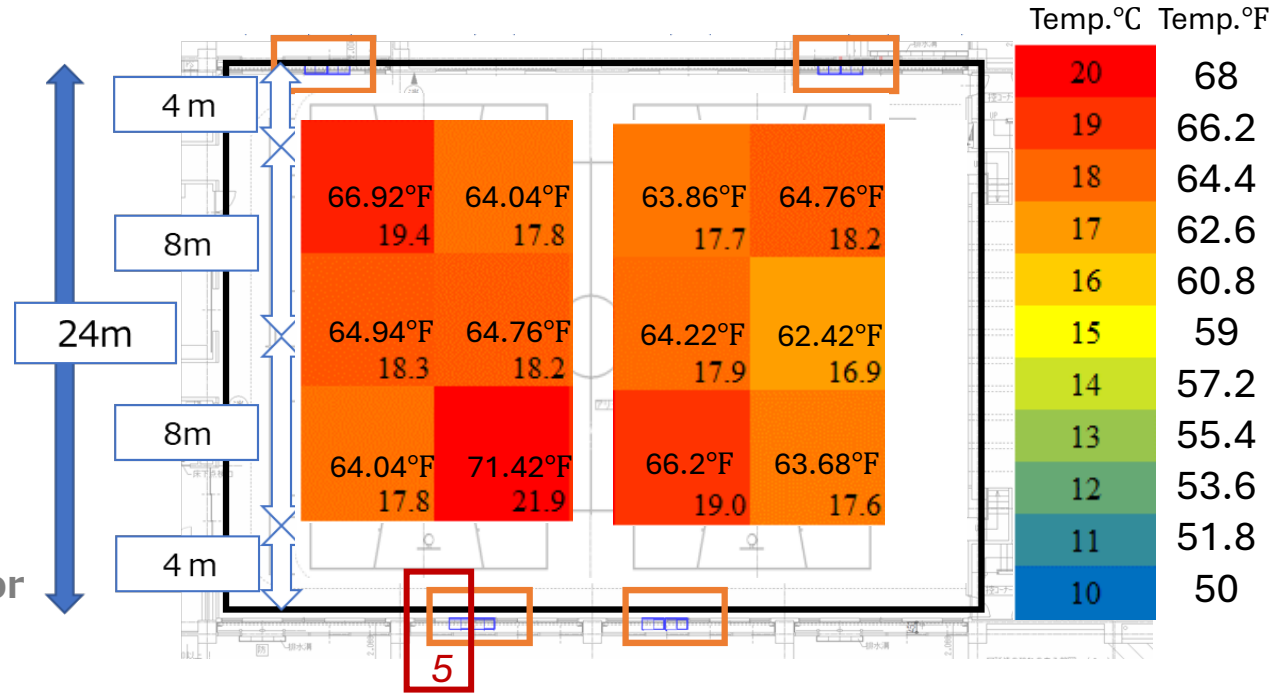
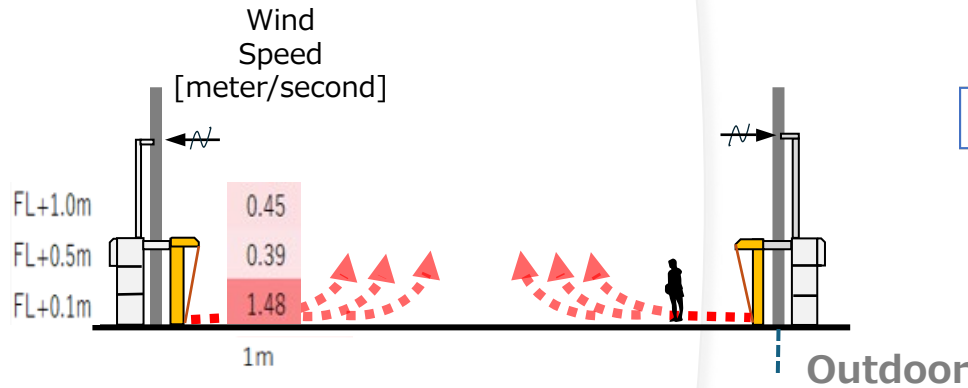
*International Standard for Airflow in Badminton Arenas: Below 0.2m/s

Play without disruption

Heating

Outdoor Temp. **12.2** 53.96°F
 Average Temp. **18.4** 65.12°F

High supply air velocity at floor level ensures effective heating, while airflow decelerates naturally to below 0.2 m/s in the occupied zone for comfort and playability.



Air Velocity Distribution During Heating Operation

Floor-level warm air delivery with low-velocity airflow in the occupied zone

【Heating】

														Wind Speed [m/s]		Wind Speed [m/s]
5	FL+1.0m	0.45	0.46	0.9	1.05	0.97	0.95	0.22	0.19	0.22	0.18	0.11	0.12	1.8	AVE	0.56
	FL+0.5m	0.39	0.52	0.57	1.01	1.07	0.95	0.15	0.18	0.2	0.25	0.14	0.18	1.4	MAX	1.77
	FL+0.1m	1.48	1.77	1.45	1.16	0.87	0.51	0.24	0.21	0.2	0.27	0.15	0.27	1	MIN	0.11
	離隔距離	1m	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	0.6		
		-Separation distance from the supply outlet														
		-Air direction from the supply outlet														0.2

Beyond an open window

Reliable Cooling for Emergency Shelters

The images show a verification test of Fresh Cool[®] conducted under simulated emergency shelter conditions.

The entire occupied zone is cooled and dehumidified within approximately 30 minutes, enabling energy savings through reduced operating time.

Even in areas where conventional recirculating air-conditioning creates stagnant “dead zones,” displacement ventilation fills the occupied zone uniformly with conditioned air, resulting in minimal temperature variation inside and outside the tents.

These results verify that Fresh Cool[®] can deliver uniform, effective cooling and dehumidification performance in gymnasiums used as emergency shelters.

【Pre-operation condition】

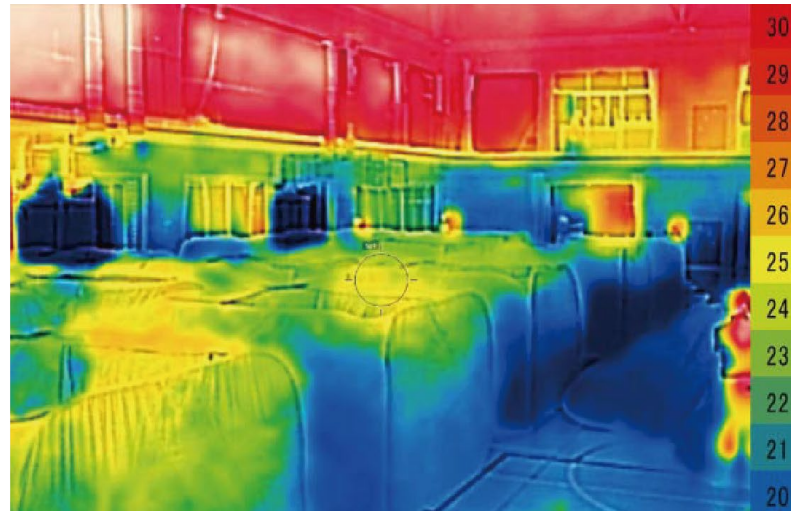
Outdoor air temperature 86.4°F(30.2°C),
relative humidity 69%



Verification test under simulated emergency shelter conditions

【Post-operation results】

Average indoor temperature 76.6°F (24.8°C),
average relative humidity 49%



Visualization of displacement ventilation airflow



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