

Seasonal HVAC & Thermal Destratification Blueprint

The Fluid Dynamics of Wind Chill Cooling vs. Ceiling Heat Recirculation

1. Ceiling Fan Seasonal Rotation & Aerodynamic Modes

Season / Mode	Rotation Direction & Speed	Aerodynamic & Thermodynamic Mechanism
Summer (Cooling)	Counter-Clockwise (Medium to High)	Blade pitch forces column of air downward (downdraft). Disrupts stagnant skin boundary layer to accelerate evaporative cooling by 4°F.
Winter (Heating)	Clockwise (Lowest Possible Speed)	Blade pitch draws cool air upward (updraft), displacing pooled ceiling heat along perimeter walls without chilling occupants below.
High Ceiling (>10 ft)	Extend Downrod by 12-24 inches	Fans mounted too close to high ceilings trap airflow in an upper boundary vortex, reducing room destratification by 60%.

2. Thermostat Offset & Efficiency Calibration Matrix

Target Room State	Thermostat Adjustment	Energy Savings & Comfort Outcome
Summer Living Room	Raise AC setpoint by 3°F to 4°F (e.g., 74°F -> 78°F).	Feels like 74°F due to wind chill; cuts compressor electrical load by 8-12%.
Winter High Ceiling	Keep heating setpoint steady at 68°F.	Redistributes 10-15°F warmer ceiling air downward; prevents furnace short-cycling.
Unoccupied Rooms	Switch fan OFF immediately upon exiting.	Fans cool human skin through evaporation, not air; running empty fans wastes watts.