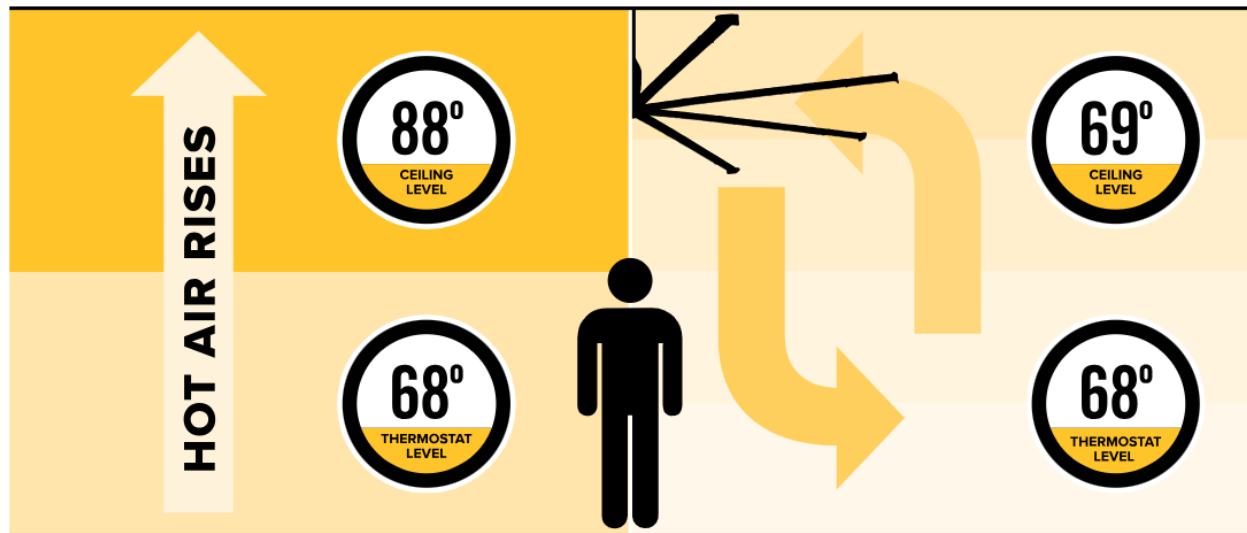


Big Ass Fans', The Hornet Tackles Air Stratification With Ease

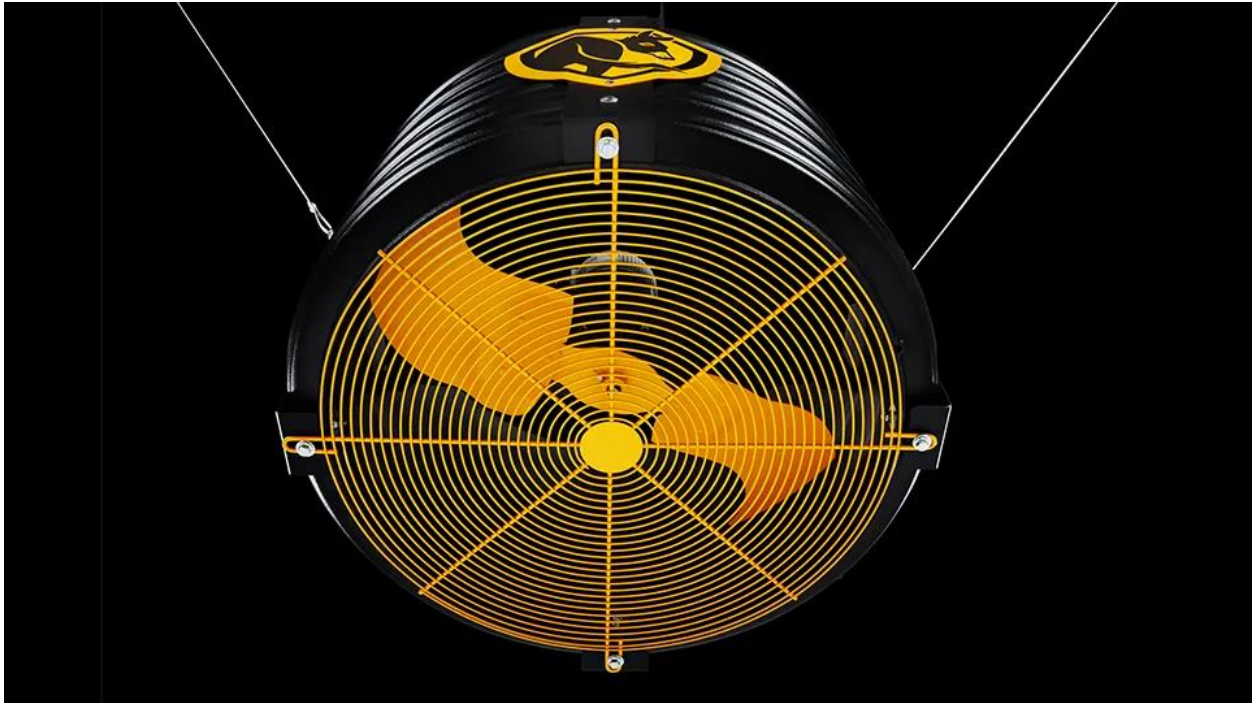
Air stratification occurs when lower density, warmer air rises, which can result in a significant thermal gradient from floor to ceiling.



The heated air typically stagnates at the ceiling due to a lack of ceiling-to-floor air circulation. When present, air stratification offers the potential for significant HVAC energy savings in buildings with tall ceilings. The elevated air temperature at the ceiling level increases the rate of heat loss through the roof and upper portions of the walls due to an increased temperature difference across the exterior surface. Mixing the air floor to ceiling, without creating a draft, provides a substantial opportunity to reduce annual heating costs. The linked [ASHRAE Journal Article](#) provides a detailed study on the energy savings available from thermal air mixing. In the article, the authors discuss several key findings. By mixing the air in the space, the vertical temperature uniformity was improved by 88%, and the air mixing solution could deliver uniform conditions in as little as 10 minutes of operation. Likewise, stratification would redevelop in as little as 15 minutes of operation, underscoring the need for continuous and non-disruptive use of air mixing solutions. In terms of energy savings, the use of the mixing fans resulted in 29% less heating fuel usage (right in line with estimate calculation methods) while maintaining the same temperature and thermal sensation at the occupant level.

Destratification (thermal air mixing) is typically performed with mixing fans, most commonly either HVLS fans, standard ceiling fans, or thermal destratifiers. HVLS fans and ceiling fans are both regulated products with a federal test procedure, minimum efficiencies, and compliance certification requirements. Thermal destratifiers, which mostly fall under the housed centrifugal air circulating fan product class, are in the process of being regulated by the US DOE as a part of the Commercial and Industrial Fans and Blowers rulemaking.

While HVLS fans provide the most efficient means of destratifying a space, HVLS fans cannot be applied in all applications. Thermal destratifiers are used in areas with low ceiling clearances, narrow aisles, or areas with dense ceiling obstructions. To address these types of areas, Big Ass Fans has introduced the Hornet. Hornet thrives in facilities with high ceilings and obstacles galore: Areas with floor to ceiling racking, overhead cranes, and massive machinery? No problem.



References/Links:

Hornet webpage - <https://bigassfans.com/hornet/>

Hornet cutsheet - <https://bigassfans.com/docs/hornet/cutsheet-hornet.pdf>

US DOE Commercial and Industrial Fans and Blowers -

https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=51&action=viewlive

Uniform Test Method for the Measurement of Energy Consumption of Air Circulating Fans -

<https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-431/subpart-J/appendix-Appendix%20B%20to%20Subpart%20J%20of%20Part%20431>

ASHRAE Journal Article - https://bigassfans.com/wp-content/uploads/2020/04/26-33_Taber-1.pdf