

# FORCED-AIR SYSTEMS VS RADIANT SYSTEMS

THERE CAN ONLY BE ONE WINNER IN THIS COMMERCIAL DEBATE



R O U N D 1

## Thermal Comfort

### Forced Air

While forced-air systems can provide a rapid burst of hot or cold air with the flip of a switch, they often create a disjointed feel across the commercial environment. Some employees are too cold, while others are too warm — and nearly everyone is frustrated.

### Radiant

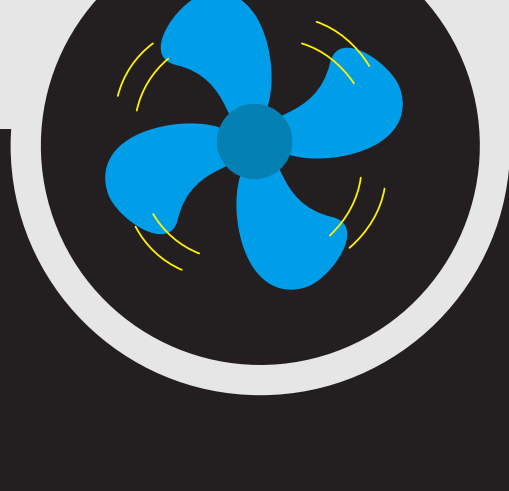
Because radiant systems heat/cool objects rather than air, they reduce drafts and provide control over radiation exchange, which directly impacts thermal comfort. So as temperature distribution becomes more even, the workplace becomes more pleasant.

**22%**

of workers report having difficulty concentrating in an office that is too hot.

**11%**

report this same difficulty in an office that's too cold.



R O U N D 2

## Indoor Air Quality

### Forced Air

Ducts may be required to filter air in and out of forced-air systems, but with this comes problems. These ducts tend to collect dust and other debris that, when pushed back out into a room's air, can provoke the symptoms of allergy sufferers.

### Radiant

Radiant systems require significantly less ductwork than their forced-air counterparts. So while there is less room for dust and debris to collect in the first place, it's also not recirculated back into the air. This leaves employees feeling healthier and more productive.

The concentrations of pollutants indoors are typically 2 to 5 times higher than most outdoor environments.<sup>2</sup>



R O U N D 3

## Overall Efficiency

### Forced Air

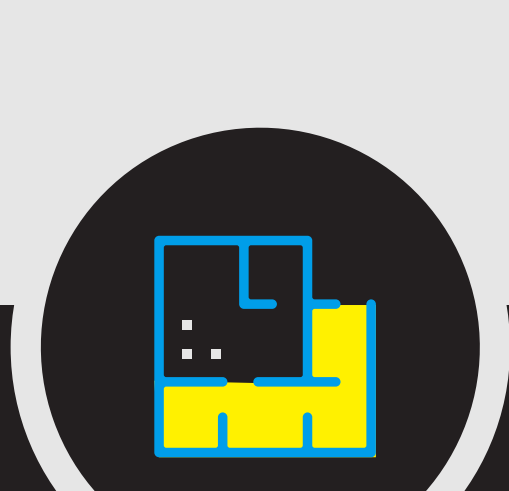
Air is not the most efficient medium for transporting energy. That's why forced-air systems often heat and cool unevenly, which decreases the efficiency of its distribution. As warm or cool air passes through the ductwork, leaks or holes can further add to energy loss.

### Radiant

Instead of air, radiant heating and cooling systems traditionally use water to heat and cool a space. This medium creates a more uniform temperature distribution while using less energy. Eliminating duct losses also contributes to a more efficient output — and thus a bigger ROI.

**BY USING RADIANT SYSTEMS, THERE IS POTENTIAL FOR:**

**46%**  
cooling energy savings



R O U N D 4

## Design Flexibility

### Forced Air

While ductwork is known for its inefficiencies, we also can't ignore the fact that it takes up a lot of space. In the case of a new construction, this addition can take up valuable real estate that could otherwise be dedicated to a more aesthetic, functional commercial structure.

### Radiant

If radiant systems are used for heating and cooling, it's actually possible to reduce the overall size of the ducts. From a commercial design perspective, this extra space could be used to add another floor within the building or reduce the height of the building to minimize costs.

While costs vary by location, the average cost of a progressive office building — one with an open floor plan and collaborative space — is \$152.23 per square foot.<sup>4</sup>



While we see radiant systems as the clear winner, we also wanted you to know that the Center for the Built Environment (CBE) shares this same sentiment.

Take a look at their research findings — and be sure try out their thermal comfort tool.

[SEE THE RESEARCH](#)

<sup>1</sup> <https://www.careerbuilder.com/share/aboutus/pressreleasesdetail.aspx?id=pr541&sd=12%2F15%2F2009&ed=12%2F31%2F2009>

<sup>2</sup> <https://www.epa.gov/report-environment/indoor-air-quality>

<sup>3</sup> <https://cqrengage.com/iapmo/RPAenergy>

<sup>4</sup> <https://www.constructiondive.com/news/jll-releases-cost-benchmark-guide-for-office-buildouts/519920/>

**viega**