FLEXIBLE WORKPLACES REQUIRE FLEXIBLE COMFORT

An Ice Air White Paper

Ask ten people in the same room whether it's comfortable, and you may get ten different answers. Comfort is not simply the temperature of a space. It is also the occupant's ability to respond to that space.

The office is changing

Today's workplaces combine open work areas, private focus rooms, collaboration spaces, quiet retreats and social hubs. Employees move among them according to their activities. Hybrid work adds another variable: occupancy can change dramatically by room and by hour.

Gensler's 2026 Global Workplace Survey found that employees globally still spend approximately 55% of their workweek in their company's office, building or site. About 39% of the week is spent working alone and 28% working with others in person. The office has not disappeared; what happens inside it has diversified. [1]

The workplace increasingly functions as a collection of environments. The question is whether the building systems serving those environments are changing with it. Flexibility cannot stop at the furniture.

There is no single definition of comfort

Two employees sitting beside one another may experience the same environment differently. ASHRAE Standard 55 recognizes that thermal comfort depends on air and radiant temperature, air speed, humidity, clothing and activity. WELL's framework also recognizes individual preferences, personal control and occupant feedback. [2, 3]

Control changes the experience

UC Berkeley researchers studying operable windows compared occupants in similar thermal environments with different degrees of personal control. Those with greater control preferred a wider range of temperatures, supporting the adaptive model of thermal comfort. [4]

The study involved a naturally ventilated building, so its findings should not be extended directly to individual HVAC controls. Its broader insight is that the ability to influence an environment can affect how otherwise similar conditions are experienced.

Buildings still must balance preferences with energy use, ventilation, equipment capacity and the needs of people sharing a space. A uniform setpoint across a large area, however, is an incomplete definition of comfort.

When architectural and mechanical zones differ

A conference room can go from ten occupants to none in an hour. A focus room may serve one person. Perimeter and interior spaces experience different loads, while quiet retreats have different acoustic expectations from social hubs.

The architectural zone and the mechanical zone do not necessarily correspond. Closer zoning and modulation can help heating and cooling respond to occupied spaces, changing schedules and varying loads.

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Designing from the occupant out

Different spaces. Different responses.

Flexible comfort does not require a separate HVAC system for every employee or unlimited individual control. It means considering the scale of environmental response alongside the scale of workplace planning.

Smaller zones can serve different loads, schedules and comfort requirements. Variable-capacity equipment can adjust output as conditions change. In appropriate applications, decentralized conditioning can bring heating and cooling closer to individual spaces.

Current heat pumps offer room-level, vertical-stack, concealed and multi-room configurations, with options for variable-speed operation, outside air, heat-recovery ventilation and low-ambient heating. Published performance data should inform selection; product labels alone should not. [5]

Decentralization brings its own design considerations: equipment location, envelope penetrations, acoustics, ventilation, condensate management, controls, maintenance access and electrical capacity. Its value, where appropriate, is a finer scale of response rather than an inherent advantage over centralization.

Cold climate is an engineering condition

Historically, air-source heat pumps lost heating capacity and efficiency as outdoor temperatures fell. DOE-supported commercial cold-climate research has targeted this challenge through compression technology, system optimization and controls. [6]

Engineers should evaluate actual low-ambient capacity, coefficient of performance, design temperature, building load and system configuration. Cold-climate capability expands the range of applications worth evaluating; it does not replace project-specific engineering.

Retrofit makes flexibility more valuable

Much of the future workplace already exists. Existing shafts, ceiling heights, electrical service, façades and mechanical infrastructure constrain what can change. Distributed conditioning may reduce reliance on extensive central distribution in suitable applications.

Electrical capacity, ventilation, envelope performance, condensate, acoustics, controls, maintenance access and possible supplemental heat still require evaluation. Smaller environmental zones may also support future changes in use, but no HVAC system can make an unsuitable building suitable for conversion.

Collaborate while the design is flexible

Early conversations among architect, engineer and manufacturer can reveal configurations, installation requirements and customization possibilities before openings, shafts, electrical requirements and mechanical zones are fixed.

The engineer remains responsible for the solution. Customization must be assessed against performance, codes, serviceability, cost and project risk. The objective is to understand the possibilities while alternatives remain practical.

Manufacturers can contribute current knowledge of equipment capabilities and limitations. In some cases, dimensions, controls or configurations can be modified around project-specific needs. Discovering that feasibility early can broaden the options available to the design team.

Comfort belongs in the workplace plan

No single mechanical strategy fits every building, climate or budget. Central systems remain important. The opportunity is to consider HVAC as part of the workplace experience: people doing different things, in different spaces, at different times, with different expectations.

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ICE9093 09/26