

**INTERPRETATION IC 55-2004-2 OF
ANSI/ASHRAE STANDARD 55-2004
THERMAL ENVIRONMENTAL CONDITIONS FOR HUMAN OCCUPANCY**

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Reference: This request for interpretation refers to the requirements in ANSI/ASHRAE Standard 55-2004, Section 5.2.4.1, Table 5.2.4.1 and Figure 5.2.4.1 relating to the allowable radiant temperature asymmetry.

Background: Section 5.2.4.1 of ASHRAE Standard 55-2004 provides limits on the temperature of cold and hot surfaces around the body based on the difference to the operative temperature. However the Standard does not provide any information on percentage of area, distances, or angle factors of the surface. Also, there is no allowance for composite conditions that may provide for flexibility in design of systems such as radiant ceiling panel heating systems.

Interpretation No. 1: In our geographic area it has become common practise to design hot water radiant heating systems to offset skin losses of the building. Typically the radiant panel will be approximately 16 inches wide installed in the ceiling of the perimeter zone. Based on the prescriptive requirements in Table 5.2.4.1 of the Standard, this means that the maximum design temperature of the radiant ceiling system is to be no more than 5°C (for a warm ceiling) above the operative temperature, regardless of the area of the ceiling that this element may comprise.

Question No. 1: Is the interpretation correct?

Answer No. 1: No.

Comments No. 1: The radiant temperature asymmetry and the plane radiant temperature are defined in Section 2 of the Standard and further treated in Section 5.4. The ceiling in its entirety is subject to the limits on radiant temperature asymmetry, not a discreet portion of it. The plane radiant temperature of the ceiling is limited to no more than 5°C above the plane radiant temperature of the floor. The space needs to be evaluated with respect to this and all other requirements of the Standard, including vertical temperature difference in the occupied zone. The Standard provides direct reference to information on angle factor calculations in ASHRAE Fundamentals Handbook in Section 5.4.

Interpretation No. 2: Similarly, Table 5.2.4.1 of the Standard seems to imply that the window surface may be no more than 10°C colder (for a cool wall) than the operative temperature. Even with thermal breaks, the window mullion will be much colder than the glazed surface. Although this mullion area is a small portion compared to the wall area for that space, again is it to be interpreted that regardless of percentage of area, the stated limits are absolutes.

Question No. 2: Is the interpretation correct?

Answer No. 2: No.

Comments No. 2: See Comment One.

Interpretation No. 3: The above examples are relative to a body being exposed to a nearby surface as stated. The same would apply to a body at some distance or some angle from the hot or cold surface.

Question No. 3: Is the interpretation correct?

Answer No. 3: No.

Comments No. 3: See Comment One. Angle factor calculations will change.

Interpretation No. 4: Is it acceptable to consider composite conditions in the space to compensate for the design of a system or selection of a component that does not meet the prescriptive requirements of this particular section of the Standard.

Question No. 4: Is the interpretation correct?

Answer No. 4: No

Comments No. 4: There is no requirement for a single component to meet prescriptive requirements. Composite conditions are addressed by the angle factor calculations to which the Standard refers.