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Radiant cooling extends comfort benefits year-round

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DURING THE PAST five years, radiant cooling has become more popular in Europe. Radiant cooling system manufacturers are popping up every year overseas, and maybe that is an indication of a trend that will take place here.

Radiant cooling shows advantages in comfort and efficiency similar to those we have experienced with radiant heating: It is quiet, with no significant air circulation patterns, offering extremely high levels of comfort and operating efficiencies that can cut operating cost in half.

From the point of view of cool air distribution, radiant cooling systems should ideally be installed overhead within the ceiling space, from which cool air can gently shower down, maintaining an even space temperature and eliminating hot and cold spots. The same tubing can, of course, also be used as a heat distribution system.

In areas where a marginal amount of heating is required, this would be the logical distribution point to do both cooling and heating with the same system. The ceiling provides the largest unrestricted distribution area possible within a given space. This allows the highest possible fluid temperatures (60-65 °F) in the cool-

ing mode, decreasing the likelihood that moisture could condense during humidity levels of 60% or higher, especially in parts of the country where high relative humidity is an important issue.

Well-proven tubing surface condensation detection controls are capable of activating a dehumidification unit to dry the air to an acceptable level whenever conditions require condensation prevention.

The second most desirable spot to utilize a radiant cooling system would be the walls. If you have to provide both heating and cooling with the same distribution system to keep the initial cost in check, the walls are definitely the way to go.

This location assures the least amount of compromise for both heating and cooling comfort. It also makes for an easy installation and keeps labor costs down.

In conjunction with lightweight construction, which is common in this country, wall distribution makes quick-responding system capable of adapting to changing temperature conditions.

Low water content and small diameter tubing, in conjunction with aluminum heating/cooling transfer plates, create a low-mass system, which is the key quick response,

efficiency, controllability and reduction of condensation. To calculate the wall area to be covered, a good rule of thumb is to use 75% to 100% of the floor area of the room to be distributed on unrestricted wall space.

As far as using the floor for radiant cooling, this should only be practiced in areas of the country where humidity levels never exceed 60% and cooling is an unnecessary luxury. It definitely represents a compromise on the cooling performance of the system. Additionally, potential condensation problems are higher because water temperatures have to be kept lower due to floor coverings and furniture coverings the transmission area.

I predict that cooling, even though it will still take a lot of research to apply it under the varied conditions existing throughout the country, has viable future in the United States, especially if both heating and cooling can be done with the same system.

The off-the-shelf technology exists. Now the experimenting and application phase will begin. The pioneer work must still be done before the industry becomes convinced that radiant cooling is viable.

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