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Radiant retrofit with hot air: A warm and lasting marriage

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A GOOD WAY TO expand hydronic heating is by introducing it into existing hot air heated homes, especially by using radiant floor heat.

Hydronic floor heating is either added to an existing hot air structure or integrated into a new hot air structure, especially in high-occupancy areas like family rooms, kitchens and bathrooms.

The key to success in selling hydronics in traditionally hot air regions is as follows:

1. Keep system cost down by limiting radiant floor heating only to frequently-occupied rooms.
2. Select family and/or living rooms, kitchens and bathrooms as target areas to give the owner the full enjoyment associated with radiant comfort.
3. Use existing heat sources to heat the system supply water. For example, use the existing water heater by piping the floor heating system into it, since a domestic hot water source is always on the premises.

Using a domestic hot water tank as a heat source for radiant heating systems of 800 sq.ft. to 1,000 sq.ft. generally does not interfere with domestic hot water production.

The amount of Btuh output needed

per square foot of floor space usually does not exceed 10-15 Btuh. The radiant system's function becomes that of a floor tempering system, where the hot air system delivers the remainder of the Btuh load under design conditions.

What is the proper hydraulic piping approach of such a system?

The biggest issue for this application is, can domestic hot water be circulated directly through the heat distribution piping or not? Always check with your local plumbing inspector and existing plumbing codes. Once you make your heating system part of your plumbing system, your local plumbing codes will become the governing regulations for the system construction. If in doubt, always consult the inspector.

In most of Canada, for instance, circulating domestic hot water through a closed-loop heating system is allowed as long as the tubing is CSA-approved and only non-ferrous components are used.

In most of the U.S., however, plumbing codes require mandatory system separation. This means that the hydronic heating water has to be separated with a heat exchanger to prevent stagnant heating water from entering the domestic hot water system.

The reason for this precaution is the concern about potential bacteria growth in the heat distribution piping, especially during non-operational times in the summer. This is a legitimate concern and can easily be eliminated by using a non-ferrous heat exchanger.

Usually an external stainless steel flat-plate heat exchanger is used with existing domestic hot water tanks, or internal copper coils are provided inside new tanks designed exactly for this dual purpose. If system separation is used, the secondary part of the heat exchange loop has to be treated just like any other closed loop system - expansion tanks, back flow preventers, must be installed.

In instances where system separation is not a local requirement, my recommendation is that you provide a totally non-ferrous system and install a timed, year-round automatic water-circulation control. The control activates the system at least once every 24 hours and runs the circulator for 15 minutes to prevent potential bacteria growth problems.

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