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Converting steam systems to hot water – a new approach

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WITH THOUSANDS OF steam systems still in operation throughout the United States, the possibilities are endless for conversion to forced hot water. The reasons are myriad. Forced hot water is more efficient and offers more even heat distribution and zone control.

When coupled with an outdoor reset control and a modern heating boiler, overall seasonal efficiencies of 90% or more are realistic, offering fast paybacks.

Why then are building owners often reluctant to change? Mainly because of conversion costs and the inconvenience incurred by the occupants when all of the old equipment must be torn out and replaced with baseboard or radiant heating.

There is, however, a less costly and disruptive method of converting to forced hot water – using PEX tubing and the existing radiators.

Crossed-linked polyethylene (PEX) is opening the door to enormous possibilities for building owner and contractors. By installing a direct supply and return line to existing steam radiators, most equipment can remain in place. When old steam radiators are converted to hot water, their Btuh output is decreased by 30% - 40%. Since improvements in insulation have usually been made to the building, these improvements offset the output loss.

To convert the system, run 3/8" or ½" PEX tubing from each radiator back to a central distribution manifold. The old steam radiators are easily convertible to forced hot water by installing a single entry valve at the original steam pipe tapping. Attach both the supply and return PEX tubing to this valve body which enters the radiator only at one point.

If you are converting a two-pipe steam radiator, use the top tapping for an air vent. Remove the old radiator hand valve and cut the steam pipe just above oar below the subfloor. The old steam piping system can remain in place if removal is too labor intensive. In fact some of the old piping runs can possibly be used as conduit chases for the small diameter PEX tubing, or as water return lines if they're in good condition.

By using long, flexible coils of PEX tubing, radiator supply and return lines can be pulled through walls and building cavities like electrical wiring, eliminating fittings and potential leakage points.

Non-electric, thermostatic control can be achieved at each radiator by installing a room temperature sensing head on the single entry valve.

One or more central manifolds, with balancing valves for each \circuit and optional electric zone controls, is then piped in hard copper tubing back to the boiler – a modern high-efficiency force hot water unit or possibly an existing, relatively new steam boiler that's been converted.

This system, coupled with constant circulation and outdoor reset control, will give you the ultimate in comfort (30%-40% radiant heat output) and efficiency no one would have dreamed possible. And you can do it at reasonable cost, without tearing the structure apart and changing the character of the building.

Cross-linked polyethylene tubing with an oxygen barrier fastened with brass compression fittings has a long standing track record in field applications and under long-therm test bench conditions.

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