

## How Much Steam Pressure Do You Really Need?

When you're having a problem getting that old steam-heated building warm, your first reaction may be to raise the boiler pressure. Don't do it! Raising the pressure in an old steam system usually leads to more problems than most contractors can handle. Here's why.

Our old heating text books tell us that the engineers who worked during the Days of Steam Heating wanted to save money as much as we do today. Since it costs money to make steam, they designed their systems to run at as low a pressure as possible, usually not more than 2 psi - and that was in a big building!

They could get by with low pressure because they sized their pipes in a way that offered very little resistance to the flow of steam. This is why steam pipes are so big.

Typically, an engineer would measure the distance from the boiler to the furthest radiator in the building. He'd then double that distance to allow for frictional losses through fittings and valves (the resistance through a fitting is greater than it is through straight pipe). He'd calculate his total "equivalent" length and then go to his steam pipe-sizing tables. Next, he'd select a pipe size that offered a pressure drop of only one or two ounces per hundred feet of equivalent run.

That's not much pressure, and that's why that old steam system will run better if you turn the pressure down, not up. By turning the pressure down, you're placing the system in the design range the old engineer had in mind. For instance, in most cases, residential systems work best when they're running off a vaporstat set to cut-in at four ounces and cut-out at 12 ounces. Not much, is it?

If your system has a pressuretrol, it usually runs best when you set the control to the lowest possible numbers, usually 1/2 psi cut-in with a 1 psi differential. Do this, and watch the difference in system performance.

If, after setting the system to lower pressure, you find you're still not getting heat, check

your air vents. They're probably clogged. Bad air vents will also cause the burner to short-cycle. It pays to check and, if necessary, replace those air vents every few years. Your customers will see the difference in fuel savings.

*More good reasons to turn the pressure down...*

### **High pressure wastes fuel.**

That long-gone engineer sized those radiators to heat the room on the coldest day of the year with 1 psi or less pressure at the radiator. When you raise the pressure, you also raise the steam's temperature, and that, of course, overheats the room. Most people respond to a too-hot room by opening the windows. Lower the pressure, and you'll save fuel.

### **High pressure causes air vents to clog.**

Remember, a steam system is an open system. It's constantly corroding, and bits of metal are always flaking off the pipes, the boiler and the radiators. When you raise the pressure, you drive those bits of metal toward the air vents, and that causes the vents to

eventually clog. What comes next? Spitting vents that waste both water and steam.

If you want to save maintenance dollars, lower the pressure.

### **High pressure can hold back condensate.**

If the condensate doesn't return quickly enough to the boiler, the boiler will go off on low-water. If there's an automatic water feeder serving the system, the boiler may flood when the condensate finally does return. Either way, you wind up with nuisance service calls - calls you can help avoid by lowering the steam pressure.

### **High pressure can cause the radiator air vents to close and not reopen.**

One-pipe steam air vents will close on steam temperature, but high pressure will often keep them from reopening - even after they've cooled. The result is little if no heat at the radiators and unhappy customers.

Trapped air will stop the movement of steam as effectively as a closed gate valve. If the steam pressure jams the vents closed, the air can't get out. Lower the pressure, and you'll release the air vents. The steam will move; the building will be warm. And you'll look like a hero!

### **High pressure encourages water hammer.**

If condensate can't drain well, it will linger in the horizontal pipes and hammer when the steam reaches it. Water hammer is one of the most destructive forces we know of. It can break pipes and cause thousands of dollars in damage. It also guarantees callbacks if you're the unlucky contractor on the job. Lower the pressure to help prevent water hammer.

### **And use the best air vents...**

We've been making Hoffman air vents for more than 80 years. Our "float & thermostatic" type vents respond to both steam temperature and spitting water. We check each vent with live steam to make sure it meets our specifications before we ship it to your wholesaler.

You can call or write your Hoffman representative, and he will provide you with our specifications. They show the venting rate of Hoffman vents in cubic inches of air per minute at the slightest pressure. They also list the "drop-away" pressures of Hoffman vents. These all important ratings show the exact point at which a Hoffman vent will reopen once it has closed. "Drop-away" pressure helps you fine-tune those old systems and really shine in your customers eyes.

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