Cross Connection

Thermal-Expansion Statement

Thermal Expansion - The Coalville City Water Dept. has installed a one-way check valve at your meter service. This has been done to prevent the backflow of water from your home into the public water system. Under certain conditions the backflow of your home's water could possibly contaminate the public water supply.

When water is heated it expands, the check valve at the meter has closed your water system, in some cases this may contribute to a condition known as Thermal Expansion. All household plumbing has a certain amount of Thermal Expansion, but in some cases the household plumbing may have excess Thermal Expansion. You may have this condition if your faucets drip intermittently or if the Test and Pressure valve on your water heater drips intermittently. Excess Thermal Expansion can easily be cured; your local plumber will be able to advise you on what needs to be done to correct the problem. If you need more information on Thermal Expansion there are many web sites that can explain in more detail. Coalville City is responsible for clean and safe drinking water to all of its customers. The prevention of possible backflow of water into the Public Drinking Water System is just one more step that we at Coalville City have taken to insure clean and safe water for all of our customers.

SOLUTION TO THERMAL EXPANSION

There are a number of products available in today's market to address the thermal expansion issue, here are 2 that are recommended that will provide long term service.

1) A properly sized thermal expansion tank.

This properly sized device is the most accepted method of controlling thermal expansion, and is recognized by most water heater industries in their literature and warranties.

2) The triple purpose toilet tank ball cock valve is designed to provide protection from thermal expansion as well. The device is designed to be installed in the place of your present ball cock assembly in your toilet tank. The assembly will govern and limit the domestic water system static pressure by discharging to the tank as required by plumbing codes.

Either solution requires periodic maintenance to ensure that the device is in good continuous working order. For more information regarding these assemblies you should contact your local plumbing supplier.

Thank You for your help and corporation with our efforts to supply you clean and safe Drinking Water.

Coalville City Water Department.
WHEN WATER IS HEATED...

It expands! Reacting to physical law, water expands in volume as its temperature rises.

In a 40 gallon water heater, for example, water being heated to "recover" after water usage, will end up expanding to about 40.53 gallons when desired temperature is reached.

IN THE “GOOD OLD” DAYS

Before the advent of cross connection control, expanded water which exceeded the capacity of the water heater...flowed back to the city main where it was easily dissipated. It was “open” at the city supply side of the system...even though it was “closed” on the system side.

CROSS CONNECTION CONTROL MEANS "NO RETURN"

Today, with back flow preventors, water meter with check valves and/or pressure reducing valves without a bypass being installed, expanded water from a water heater cannot return to the city supply. It is now a closed system, and expanded water has no place to go.

WATER IS NOT COMPRESSIBLE

Since water completely filled the water heater and system piping before recovery started, and since it can’t be compressed...the expanded volume, even though small, has no space in which it can be accommodated.

As a result, the expanding water creates a rapid and dangerous pressure increase in the water heater and system piping, much like the action of a hydraulic ram.

SO “POP” GOES THE RELIEF VALVE

The setting on the safety relief is quickly reached and the relief valve opens, losing heater water down the drain...or, more often than not, all over the floor.

This illogical practice of operating your safety valve, once or twice a day, is not only wasteful...(you paid money to heat that hot water that went down the drain)...it’s also dangerous.
First of all...the T & P relief valve you have installed serves as an emergency control only. It never was designed as an operating control. Once a safety valve is used on a daily basis, it isn't that safe.

Deposits on the seat...deteriorating springs ... wear and tear erosion can wear out a relief valve in no time at all.

DANGEROUS PRESSURES BEFORE RELIEF
What most people don't realize is that dangerous conditions can exist during thermal expansion long before the relief valve operates.

Internal pressures repeatedly occurring during recovery periods can collapse the center flue of a gas-fired water heater...creating a hazardous presence of deadly carbon monoxide gas...or even a water heater explosion.

Even though the relief valve operates during each recovering period, internal high pressures occurring over and over again can accelerate tank leakage, and shorten water heater life...no matter how it is fired.

The best solution to thermal expansion is to control pressure it generates within normal, safe operating range, well below the emergency setting of a relief valve. This will allow thermal expansion to occur, but without causing a dangerous increase in pressure.
This can easily be accomplished by adding a small expansion tank with a sealed-in compressible air cushion which will compress as thermal expansion occurs...providing a space to hold and store the additional expanded water volume.

By sizing the air cushion according to Boyle’s Law, we can select the maximum pressure on the system when the total amount of expanded water has been generated.

When hot water is used in the system...the pressurized air cushion forces hot water back into the system for use...not waste.

The thermal expansion tank features the sealed-in air cushion...pre-charged to the minimum system pressure before recovery is started. A rugged butyl diaphragm seals in the air cushion and also separates air from hot domestic water to prevent air from being dissolved by hot system water.

Finally, on the water side of the expansion tank is a separate rigid polypropylene liner so fresh, corrosive domestic hot water can be handled without fear of corrosion and leaks.
The thermal expansion tank for domestic water heaters, sized right, is the only logical answer to the growing problem of thermal expansion in water heaters protected by BFP, check valves or pressure reducing valves. A simple installation to the supply side on the water heater, the small tank will eliminate the dangerous condition so that the relief valve will never open.

The Therm-X-Trol, Model ST-12 manufactured by AMTROL Inc., for example, with a volume of only 4.4 gallons, will safely handle thermal expansion of residential water heaters up to 120 gallons in size, with maximum of 80 lb. supply pressure and a maximum temperature of 180°F.

AMTROL's application manual will cover application and sizing of AMTROL's other models and sizes to handle all other domestic water heating systems from small to very largest... including commercial and industrial "dump" processing usage.