

Steam Boilers

Steam is a good heat distribution medium because it moves easily through the system and it has an extremely high heat-holding capacity. Steam's heat-holding capacity is much greater than that of water. Consider that when one pound of water moves heat, it gives up one BTU for every degree Fahrenheit it changes in temperature. That means if water in a distribution system dropped from 180°F to 100°F, it would give up only 80 BTUs. One pound of steam on the other hand gives up 970 BTUs when it condenses. This is known as its latent heat of vaporization. So you can see how steam is able to carry such an enormous amount of heat.

Generally found in homes built before World War II, steam systems are similar to hot water systems. Steam systems operate at very low pressures and generally under 220°F. No circulating pump is required to distribute the steam throughout the home. It rises naturally, then as it gives up its heat to the surrounding air in the home, it begins to condense and must be either gravity fed or pumped back to the boiler.

The steam system's heat exchanger is a metal element that separates a combustion chamber from a water tank. The tank can be located above the combustion chamber, or wrapped partially or completely around it.

Enough space is provided above the water line in the tank to allow for evaporation. This space is called the "steam dome." The supply pipe, located well above the water line, carries steam out of the boiler and up to radiators in the conditioned portion of the home.

The steam's heat is transferred into the living area through a metal radiator or convector, which is heated by the steam and transfers that heat into the room both by radiation to people and objects in the room and by conduction and convection to the air that contacts the radiator. The heated air then forms convection currents, which carry the heat throughout the room. Steam heat can be distributed by one or two pipe systems. You can tell which is which by determining how many pipes enter and leave the radiator.

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