pulse flow manufacturing

WETBACK" WATER HEATING

The term 'wetback' originated back in early days comprising a water filled device in the form of a narrow box type rectangular heat exchanger placed in the back of an open fire. Later this was superseded by a tubular ladder type device as an improved version.

The aforementioned designs relied on the thermosyphon principle where the hot water rises at the top outlet of the wetback and the displacement of which allowed the cold water to enter the wetback at the lower inlet port to obtain effective circulation of this action the reservoir hot water cylinder must be located at least 3Omm minimum above the tire or the higher the better.

Coupled with this requirement is a limited distance between the fire and the HWC of 4 metres maximum. However HWC located closer is desirable, just through the wall is even better.

MODERN TECHNOLOGY

Modern log and boosters versus High Performance Pulse Flow technology.

Boosters: In general the old design of a tubular bent pip placed in the fire chamber utilising the thermosyphon system of limited distance and high placement of the HWC is the norm these units hold up to 1.5 litres of water giving a Chill factor that affects the emission test of the fire. Some types of bent pipe wetbacks are encased in steel or aluminium to shield the chill and enable emission testing to comply with the clean air standards. Round tubes also suffer the 'coring' phenomenon resulting in mediocre performance.

See illustration - Coring

Boosters require that the electricity is kept on the HWC to ensure that 6OdegC temp is maintained to counter Legionella forming in the water. The average booster raises the temp between 18degC to 38degC and electricity consumption is reduced.

"Coring Phenomenon"

In understanding the physics of water, what appears to be least understood is what happens to water when it is heated in a round tube of the current bent pipe design as presented in the market place as a wetback booster.

When heat is applied to the outer surface of a tube, a high temperature boundary layer is formed on the inner surface. Since this water adheres to the inner surface a flow of lower temperature water passes through the centre in the form of a fluid core. The result is poor performance.

To counter this low performance condition it then proved practical to flatten the multi tube design to bring the temperature boundary layers together and eliminate the core. The results are self evident in obtaining the desired increase in performance the multi flat tube technology incorporated in modem wetback design reduced the amount of water required in the unit down to 300 to 400 millilitres as opposed to the I litre to 1.5 litres contained in the single bent tube configuration. This meant fewer

problems in the clean at testing of the modem solid fuel fires.

PULSE FLOW SAFETY VALVE

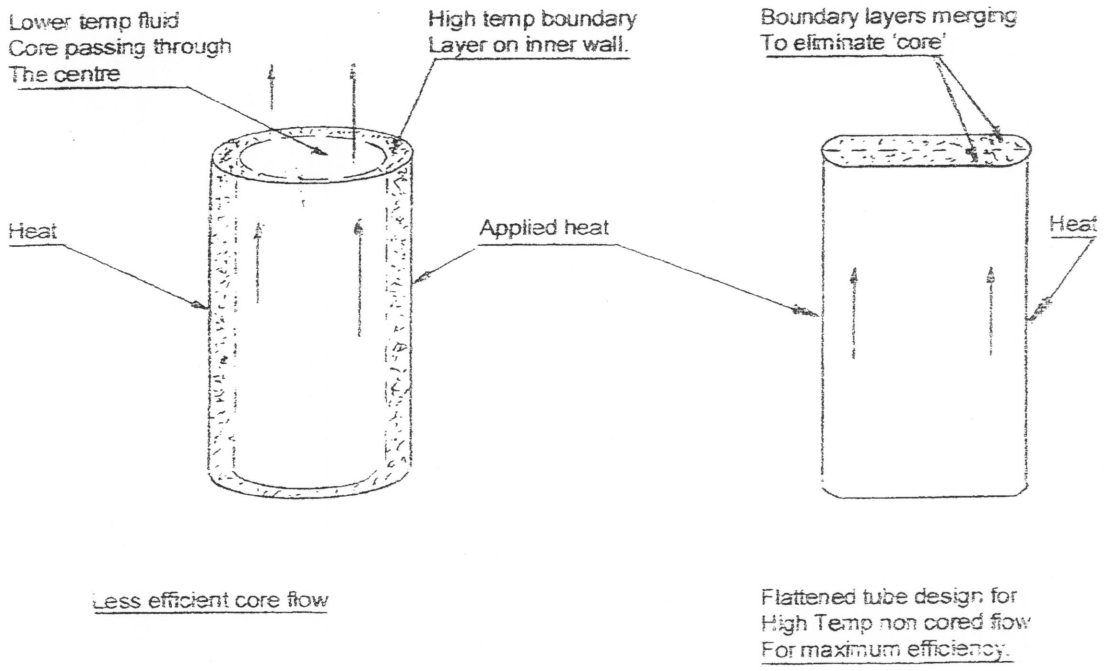
Having established a wetback of flat tube design, tests proved that high energy generated by the 3% expansion of the water created a high thrust factor on the hot outlet side and produced positive kinetic flow in the pipe to the HWC.

To ensure and control this high thrust action in the wetback, a special patented Pulse Flow safety valve is connected to the cold inlet side of the wetback.
Its purpose is to lock a fresh supply of water in the wetback until it heats and when a powerful surge occurs at the hot outlet, the valve opens and a fresh charge is sucked in and the cycle repeated so long as the heat is applied.

To ensure that should system malfunction occur. The valve utilises a safety spring, enabling a flow reversal to the circuit. Having established a reliable town of thermal pumping it then became possible to move hot water in several directions without an electric pump, up to 40 metres so far.
Hot water cylinders mounted in basements with the fire upstairs, pipe work over ceilings in concrete floored houses and radiators run without an electric pump heated from a dual wetback. All these systems have operated for many years, however, like any pumping system, the Pulse flow system requires a specific circuit plan to engage the physics of water flow for best results.

NO ELECTRIC PUMP REQUIRED FOR THESE SYSTEMS
20MM COPPER PIPE THROUGHOUT PLUMBING

FOR MORE IN DEPTH INFORMATION PLEASE CONTACT PULSEFLOW MANUFACTURING.



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