BACKGROUND ON STEAM TRAPS OLD AND NEW

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WHAT DO STEAM TRAPS DO?

The job of a steam trap is to trap, or hold, steam within the steam system while draining condensate out of it. It sounds simple, but a steam trap also has to:

- Vent air and non-condensable gases at start-up;
- Discharge large quantities of cold condensate as steam enters the system;
- Discharge much smaller amounts of hot condensate on achieving temperature, and over varying conditions, without passing live steam.

In the past, only mechanical traps have been available to tackle these demands. They have large orifices with various bucket and float valve mechanisms, and they do the job with various degrees of success. But they all have moving parts which, in time, fail.

NOW THE GEM TRAP HAS CHANGED ALL THAT.

BEFORE GEM Traps

AFTER GEM Traps

WHAT MAKES GEM TRAPS DIFFERENT?

GEM Traps have a revolutionary venturi orifice design, which enables them to perform the job of a steam trap without the need for moving parts. This means that GEM Traps will not wear out and fail.

Cross section of GEM Sapphire Trap

Like all orifice traps, the GEM Steam Traps used in the GEM Condensate Return System work by using the difference in density between steam and condensate.

Condensate is 1,000 times denser than steam and so passes through an orifice very much slower than steam. Steam, without condensate present, will typically pass through an orifice at velocities approaching Mach 1! So slow-moving condensate squeezes out low density steam as it approaches the orifice. The high density, slow moving condensate is then preferentially discharged through the orifice, trapping the low density steam behind it.

This principle has been used since the 1960s, when the US Navy converted its fleet to orifice plate with fixed discharge capacities. However industrial systems have varying loads, so the GEM trap was developed in 1995 with a 'Venturi' to regulate condensate capacity over the full range of operating conditions.*

*See 'How GEM Trap Works" and the "University Research" brochure inserts.

OPPOSITE: Condensate receiver vent at a Withington Hospital laundry before and after fitting GEM Traps. - See EEBPP case study*.
(All applications with varying loads and no control valves. Previously, the mechanical traps were regularly tested and maintained.)