

**Clayton Steam Generators have become an integral part of a manufacturing process for a critical-care medical diagnostic system.**

Two Clayton Steam Generators operate at the factory of Bayer Diagnostics Manufacturing (Sudbury) Ltd, who are the worlds fourth largest diagnostic company. Their critical care systems deliver rapid test results of electrolytes, metabolites CO-oximetry and a broad range of blood gases for point-of-care applications.

The Clayton Steam Generators, provide dry steam for the process and have rapid start-up capabilities. Their operation is based on a simple but ingenious concept of forced water circulation through a heated coil. Water is pumped through the coil by a specially designed



feedwater pump and the steam/water mixture which is produced at the outlet of the coil is directed to a high efficiency vortex separator. The steam quality at the outlet of the separator is at least 99.5% dry saturated.

The coil of the Clayton Steam Generator is a single continuous wound tube which is arranged in layers at the top section of the generator and



forms a water wall around the combustion chamber in the lower section.

The configuration and spacing of the coil are designed to optimise heat transfer between the water and the hot gasses which flow over the coil from the combustion chamber.

In a Clayton Steam Generator the water flows down through the coil and the hot gasses flow upwards, in the opposite direction. This means that the cold water enters the coil where the combustion gasses are coolest and the steam/water mixture leaves the coil where the combustion gasses are hottest. This leads to low flue outlet temperatures which indicates high efficiencies are being achieved.

Another advantage of the monotube coil concept is that only a small amount of water is stored in the steam generator. This means that rapid response is possible and a Clayton Steam Generator can start up from a completely cold condition within five minutes. The low

water content also leads to small space requirements and Bayer were able accommodate the two Clayton Model EG-40-1 Steam Generators, with a total steam output of 1200 kg/h, by adding only a small extension to the existing manufacturing plant.

The new plant room also houses the water treatment equipment which was also supplied by and this includes a feedwater hotwell, a water softening plant, booster pumps and a chemical dosing system.

**Phil Wilson** who is Bayer's Project Manager for this new installation said, *"the steam supply is an important part of the process and we needed a reliable, self-contained plant which would operate unattended and give us the high quality steam required"*.