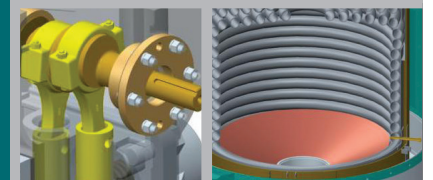


Steam Generators

Advanced
Steam Boiler
Technology that
Is Safe, Efficient
and Reliable



SAVES FUEL
SAVES SPACE
SAVES TIME
SAVES MONEY



Advanced boiler technology for all steam applications, with many benefits



COMPACT SIZE

Smaller size means a smaller space requirement. Clayton Steam Generators generally fit into any available area, reducing construction costs on new building installations.

FUEL EFFICIENT

Clayton's high efficiency design translates into lower operating costs and improved overall system operation.

RESPONSIVE

Very rapid response to changing steam loads means the Clayton Steam Generator will automatically modulate to match your steam load profile while maintaining system steam pressure.

SAFE

Our *once-through* design eliminates the possibility of a steam or water-side explosion. The Clayton Steam Generator is simply the safest steam boiler available on the market.

COMPACT, HIGHLY EFFICIENT, QUICK-STARTING
STEAM GENERATOR SYSTEMS



LESS WATER WASTE

Clayton's design concentrates TDS blowdown significantly, reducing fuel, water and chemical costs.

FAST START

Full steam pressure and output in minutes from a cold startup saves fuel and labor cost over conventional designs and eliminates wasted fuel from idling.

AUTOMATIC

Operation is automatically controlled. The Clayton Steam Generator can be started from a single switch or remotely using the automatic start option.

LOW WEIGHT

Its relatively light weight means that all sizes of Clayton Steam Generators can be easily moved and installed; even in areas with limited structural support.

RELIABLE

Field proven reliability of the Clayton Steam Generator is unsurpassed, resulting in greatly reduced operator maintenance and attendance.

QUALITY

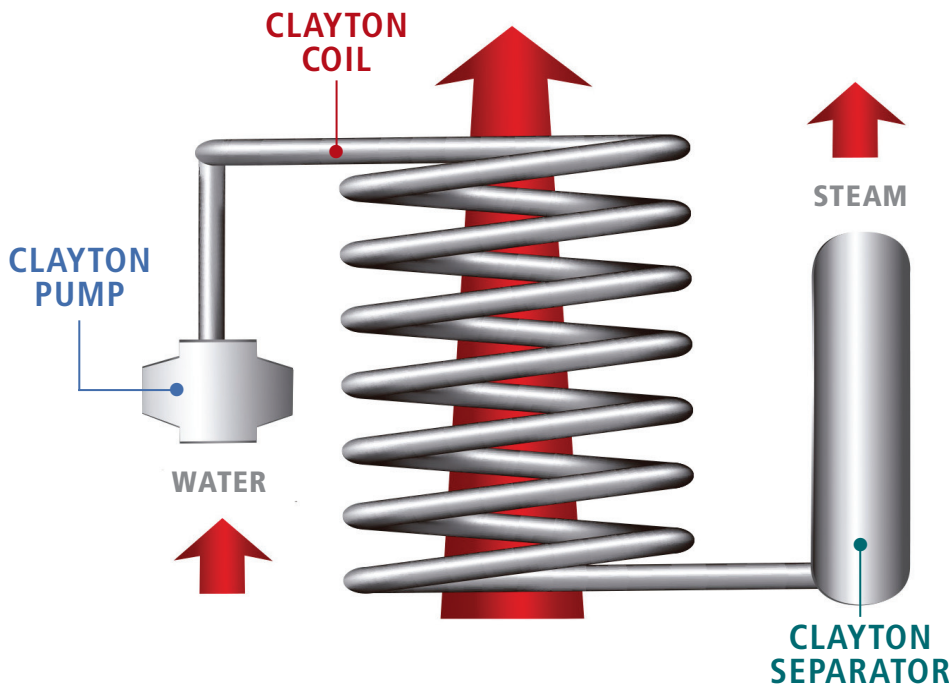
Steam quality in excess of 99.5% dryness is assured at all times. This is the highest steam quality of any competitor's design. Less water and impurities further increase your energy efficiency.

Advanced boiler technology of the Clayton steam generator

THE CLAYTON PUMP | THE CLAYTON COIL | THE CLAYTON SEPARATOR

FEATURES

The many advantages of using the Clayton Steam Generator is the result of combining three unique and proven technologies.



CLAYTON COIL

- Counter Flow Heat Exchanger
- No Refractory Insulation
- Small Steel Mass
- Low Heat Loss
- Single Pass Heating
- Upfired Burner
- Rapid Heat Transfer

CLAYTON PUMP

- Small Water Content
- Pre-Heated Water
- Controlled Water Flow

CLAYTON SEPARATOR

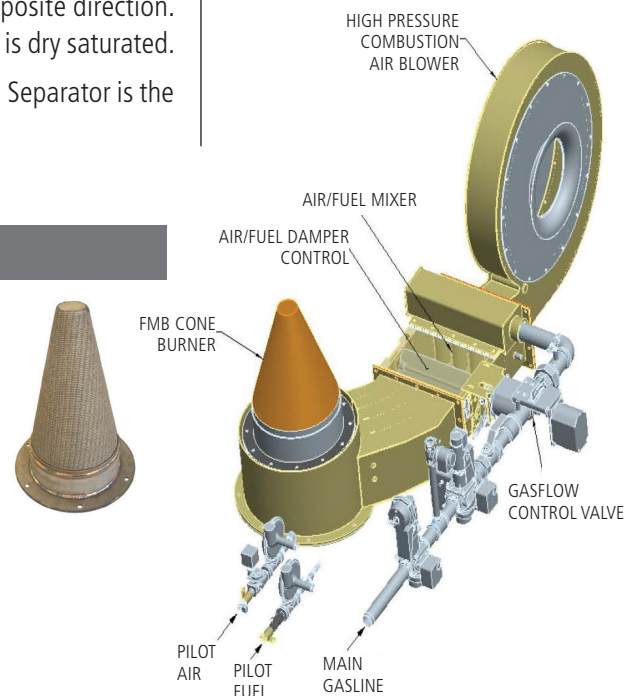
- Vortex Action
- No Moving Parts
- Automatic Blowdown

To produce steam in a Clayton Steam Generator, water goes in one end and high-quality steam comes out the other. The boiler feed water is pumped through the helical water tube coil from the top to the bottom while heat is passed over the coil in the opposite direction. The high efficiency separator at the outlet of the coil ensures that the steam is dry saturated.

The principle of forced circulation of water using the Clayton Pump, Coil and Separator is the basis for the many benefits of using the Clayton Steam Generator.

LOW NO_x TECHNOLOGY

To meet increasing demands for cleaner technologies, Clayton has created an advanced ultra low NO_x burner system available on all our gas-fired steam generator units. The FMB (Fiber Metal Burner) technology achieves ultra low emissions through a combination of improved fuel and air mixing and very low, short flame length. This proven system is automatically controlled and capable of meeting strict local air emissions standards.



COMPACT, HIGHLY EFFICIENT, QUICK-STARTING STEAM GENERATOR SYSTEMS



THE CLAYTON PUMP

The Clayton Pump has been designed specifically for the continuous supply of high-pressure and high-temperature feedwater to the Clayton Steam Generator and has exceptional durability. The pump does not have any glands or mechanical seals and the moving parts are semi-submerged in an oil reservoir. Faultless operation is achieved by the use of a reciprocating piston that pushes oil against a diaphragm that, in turn, moves water in a vertical column. The water inlet and outlet is at the top of the column so that heat from the water being pumped does not reach the pump mechanism. The complete assembly is housed in an extremely strong cast ductile iron block.

The Clayton Pump is unsurpassed for long life, reliability and performance.

THE CLAYTON COIL

The Clayton Coil has been developed for high heat transfer and long-term reliability. Its unique design allows water and heat to flow in opposite directions in a single pass. This counterflow pattern is the most efficient way to transfer heat energy and provides preheating of the incoming water. Each coil layer is carefully staggered, compared to the next. The spacing between each layer is varied so a constant high velocity is maintained as the flue gas density changes with temperature. The diameter of the tube also becomes larger as the water temperature increases and steam is produced. In the lower section, the coil forms a water wall around the combustion chamber that minimizes external heat loss. The result is fast heat transfer, even heat distribution and no hot spots.

Mechanically, the coil acts like a spring to eliminate the effects of expansion. This allows Clayton Steam Generators to be started and stopped as frequently and as quickly as required without the possibility of mechanical damage.

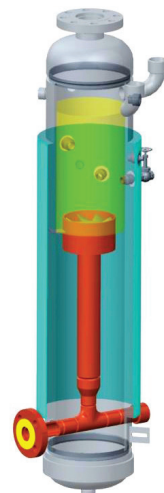
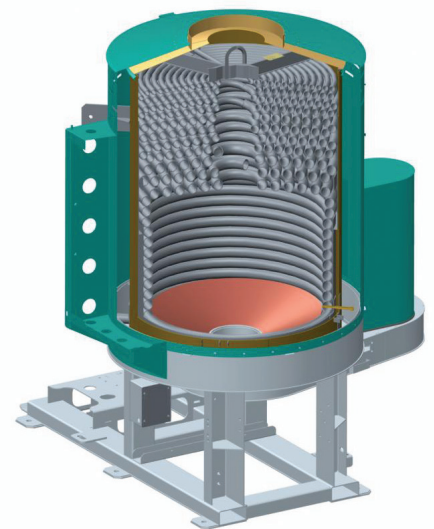
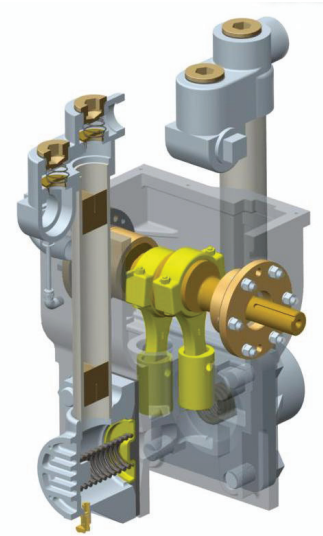
The Clayton Coil is the heart of the Clayton Steam Generator and has benefits that are not available with any other boiler.

THE CLAYTON SEPARATOR

The Clayton Separator guarantees high-quality steam by combining cyclone separation and screen mist removal. The Separator operates in conjunction with the Clayton forced flow principle to guarantee steam quality of at least 99.5% dry saturated under all load conditions.

The separator does not have any moving parts and no maintenance is required. A series of vanes produce a vortex flow pattern that removes water particles by centrifugal action. The separated droplets are collected and recycled. Impurities are simultaneously separated and can be removed by automatically *blowing down* a very small quantity of the collected water. No other blowdown is required and the total dissolved solids in the incoming water can be as high as 8,550 ppm.

The Clayton Separator produces high-quality steam that is the best available from any type of boiler.



Used by the world's leading companies

MODELS UP TO 2,000 BHP / 20 MW WITH DESIGN PRESSURES UP TO 3,000 PSIG / 200 BARG
SATURATED AND SUPERHEATED STEAM



COMPACT, HIGHLY EFFICIENT, QUICK-STARTING
STEAM GENERATOR SYSTEMS



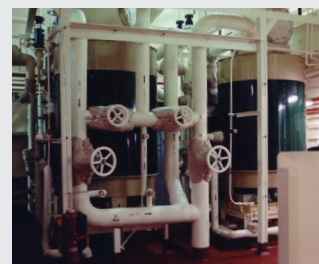
SKID MOUNTED SYSTEMS



CONTAINERIZED UNITS



OFFSHORE / MARINE



COMPACT, HIGHLY EFFICIENT, QUICK-STARTING
STEAM GENERATOR SYSTEMS



The Clayton Story

In 1930, Clayton Industries was formed in California by five engineers who were involved in the investigation and development of new concepts in thermodynamics pertaining to mechanical products. Fuel conservation was always a concern to William Clayton, founder of Clayton Industries, long before modern-day awareness of dwindling fuel resources through our energy use. The Clayton Steam Generator evolved as a method to efficiently produce steam that is based on forced circulation of water. It was an immediate success and was being mass produced with thousands of units in daily operation by the 1940s. To meet a worldwide demand, Clayton Industries rapidly expanded overseas with purpose-built factories, licensed agreements, subsidiary companies and affiliates; while remaining a privately-owned company.

Technological advancements continued throughout the years and models with larger outputs are continually being added to Clayton's highly-respected product line. Since its inception, all of Clayton's customers have remained loyal patrons.

WORLDWIDE SALES & SERVICE

Clayton Industries services the world with major manufacturing facilities in the USA, Europe, Latin America, and Asia. Clayton direct sales and service offices, subsidiary companies and authorized distributors are located worldwide offering lifetime customer support 24/7.

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