

STEAM
GENERATORS

Young Living Farms installed Clayton steam generators, reducing fuel and energy cost per kilo of their essential oils by 32% and more

The boiler Young Living Farms was using at its Highland Flats Distillery was not nearly as efficient as it needed to be for a global leader in essential oils. Clayton Industries helped them transition to rapid on-demand steam generation, resulting in significant production efficiencies.

Young Living Farms, headquartered in Lehi, Utah, produces the best essential oils in the world. Fueled by a growing demand for top-quality essential oils, it now has offices in Australia, Europe, Canada, Japan, and Singapore – and farms located around the world. Young Living sells its products through a global network of member distributors, so maintaining inventory and controlling costs is imperative.

“The older firetube boiler Young Living had been using at its Highland Flats Distillery in Naples, Idaho, was not nearly as efficient as it needed to be for a global leader in essential oils,” said Mario Talavera, Sr., Western Regional Sales Manager for Clayton Industries.

That is due to the ratio of having to heat 3,000 gallons of water up to 70 pounds per square inch of steam pressure from a cold start or dry start – which would take up to five or more hours. Plus, the firetube boiler required an additional hour to bleed off the steam at shutdowns to leave it in a safe, depressurized, risk-free state.

The time came to replace the boiler, and Executive Director Brett Packer was eager to put a steam generator from Clayton Industries to the test.

“A Canadian colleague, Cory Howden, who managed our Northern Lights Distillery in Fort Nelson, British Columbia, had been



talking with me for a while about switching from the Scotch Marine Boiler [firetube boiler] to a steam generator from Clayton,” Packer said. “He told me it worked more like on-demand steam and is much safer and more efficient.”

Young Living replaced its single 500 BHP firetube boiler at the Highland Flats Distillery with TWO Clayton 150 BHP steam generators. **When the new steam solution went online the efficiency skyrocketed, and energy savings were**

incredible, because with rapid on-demand steam they can now go from totally cold to full-steam output in roughly five minutes.

Advanced
Steam
Technology
that Is Safe,
Efficient
and Reliable

“Switching to Clayton steam generators resulted in a 32+% reduction in the cost of fuel and utilities per kilo of oil, which is the unit we use to measure production. We also gained significant production efficiencies. Clayton generators reduced our operators’ hours by ten percent.”

BRETT PACKER, EXECUTIVE DIRECTOR, YOUNG LIVING FARMS



With the fast reaction time of Clayton 150 BHP generators, steam could be produced on demand for morning production. That resulted in an immediate 32+% energy savings.

A two-generator advantage

With both steam generators fitting in the same footprint as the 500 BHP firetube boiler, Young Living gained another advantage: they could have one generator running and one generator for backup.

“If there would ever be a problem, having a backup allows us to keep production going while we take time to identify the issue and correct it,” Packer said.

Being able to adjust to harvest changes within minutes supported Young Living’s need for flexible manufacturing.

Increased efficiency through rapid on-demand steam operation and incredibly low emissions levels were key reasons why the company chose to install Clayton generators. Production flexibility was another critical advantage.

The Clayton steam generators allowed the facility in Naples, Idaho, to adjust to harvest changes minute to minute. Packer said that with Clayton generators, they could adjust steam pressures as needed in just seconds – depending on the material demand and stages of production. The Clayton generators can fully supply needed steam demand, from completely shut down to fully operational, in five minutes. In contrast, the old boiler had a 90 minute or longer turnaround time window to fire up or shut down.

The quality of steam from Clayton generators helped Young Living Farms increase its yields and meet its world-leading quality standards.

Young Living is committed to providing pure, powerful products, all infused with their essential oils’ life-changing benefits and has designed and built the largest, most

technologically advanced essential oil distilleries in North America.

“Distilling pure essential oils is a meticulous process,” Packer said. “The quality of the steam from Clayton generators is 99.5% dry, so it’s ideal for steam extraction and has increased our yields.”

In the steam distillation of essential oils, steam is directed into food-grade, stainless steel extraction chambers containing biomass (aromatic plant or trees). The steam is applied directly to the surface area of different types of biomass. The direct steam causes the biomass’s volatile molecules to get directed to a condenser where non-contact cooling water condenses the steam with volatile molecules into a liquid form called distillate. The distillate gravity feeds into a separator where the less dense molecules float to the top and are collected in a funnel that leads

to a tap. The amount of oil yielded varies depending on the biomass used and the species of plant or tree.

“The many positive aspects of the Clayton Industries’ steam generator have improved our ability to keep up with inventory demands,” Packer said. “Ever since the Clayton install at the Highland Flats Distillery, we’ve been able to supply all needed inventory levels of the oils from three conifer species we provide to our distribution center. These oils get blended into hundreds of Young Living finished goods, one of which is a top-10, best-selling product out of all of Young Living’s product lines.”

Maximizing employee safety and protecting them and the plant from a catastrophic event was another top priority when choosing a replacement steam system.

When it comes to safety, the simple question is this: Do you want a boiler that has the potential to explode or one that doesn’t? Packer said one thing that sold him on Clayton generators was that he’d heard they present a lower risk of an accident than a residential water heater.

Clayton Sales Manager Talavera noted that as far back as 1930, when Clayton Industries began, there has



The two Clayton 150 BHP steam generators fit in the same footprint as the single 500 BHP firetube boiler they were replacing. Young Living Farms could now have one generator running and one generator for backup.

never been an explosion in a Clayton Steam Generator. That’s due to two Clayton design features.

The first is low water content. With a firetube boiler, a massive amount of water is brought up to temperature all at the same time. It’s all contained in the same boiler shell. And all of it is pressurized. So, in the event of a rupture, all of this energy is released simultaneously and can be catastrophic. Clayton’s design keeps a low water volume in its generators, which minimizes explosive potential.

Clayton’s second safety feature is coil design. Even in the unlikely event of a leak in a Clayton heating coil, it cannot instantaneously release the energy contained within the steam.

“It would be similar to a cut in a garden hose,” Talavera explained. “The steam would have to travel through the coils to reach the source of the leak, which would emerge as a slow trickle. It’s not like a firetube boiler where all of the energy would be released at once, potentially resulting in a massive explosion. Plus, with a Clayton steam generator, the coil is contained inside the generator’s welded steel shell. Any released energy would harmlessly exit through the exhaust stack and into the atmosphere. There would be no harm to personnel or the plant.”

Brett Packer has been impressed by the results: “Two more Young Living Farms’ distilleries are in the process of conversions to steam generators,” Packer said. “I’m working on system proposals to begin Clayton installs at Ecuadorian and European Young Living distilleries.” 🇺🇸



The Clayton steam generators installed at the Highland Flats Distillery enabled Young Living to keep up with inventory demand for oils from three conifer species that get blended into hundreds of their finished goods.



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