



## Miura LX-100 On-Demand Steam Boiler Delivers Economy, Efficiency, And Sustainability

**Space-Saving Design, Microprocessor-Controlled Precision Operation, and Advanced Monitoring & Diagnostic Features Also Cited As Efficiency-Boosting Advantages for a Growing Craft Brewery**

The largest craft brewer in North Carolina, Asheville's Highland Brewing Company has grown considerably since it began operation as a basement start-up using retrofitted dairy equipment in 1994. Today Highland occupies a large, efficient brewery that produces an array of popular ales anticipated to exceed 25,000 barrels this year.



Integral to Highland's expansion was its recent choice of a gas-fired LX-100 boiler from Miura, the world leader in ultra-low NOx modular on-demand steam solutions. As Director of Operations Kevin Wheeler explains, there are multiple reasons why the Miura LX-100 is an excellent ingredient in Highland's formula for achieving a combination of improved operational efficiencies, fuel economy, and environmental sustainability.

"When we decided to increase our brewing capacity we spoke to other craft brewers and learned of Miura's great reputation," Wheeler recalls. "Miura met our needs in terms of energy savings, on-demand steam, low emissions, and a smaller footprint."

Microprocessor-controlled for precision operation, Miura boilers save an average of 20 percent annually on fuel costs over other boilers for typical installations. This savings is due to Miura's unique

"once-through" fin-tube design, which conserves fuel, water, and physical space. Even with a smaller footprint, however, Miura's exclusive design produces BHP outputs comparable to much larger units. Utilizing its unique "floating header" design, Miura's boilers are engineered to go from a cold start to full steam in less than five minutes. This on-demand steam-generation feature enables users to precisely match load fluctuations as they occur, instead of consuming energy while idling a boiler in stand-by.

"We use our LX-100 to heat our brewing water (known as 'hot liquor'), we use it on our keg line for heat/steam/sanitation, and we use it for our boil and our mash in the brewing process," Wheeler says. "Sometimes we need lots of steam; other times we don't. A conventional-style boiler would need to run constantly to maintain its peak output level. With the Miura LX-100, however, we can shut it off all weekend, blow it down, drain it out, and save gas. On Monday morning we turn it on and have full steam by the time we walk over to the brew house."

### A Strong Environmental Commitment

Coupled with the lower energy usage of Miura boilers is their reduced emissions of nitrogen oxides (NOx), a major contributor to air pollution, as well as carbon dioxide (CO<sub>2</sub>), the most prevalent of greenhouse gases. Miura boilers achieve low-NOx performance by reducing the temperature of the boiler's flame, which in turn reduces the amount of excited nitrogen atoms available to bond with oxygen to form nitrogen oxides. As a result, NOx emissions are reduced to around one-quarter of what traditional fire-tube boilers emit. This enables Miura boilers to comply with even the most stringent air-quality regulations. With regard to reduced CO<sub>2</sub> emissions, Miura's technology leverages superior operating efficiency to contribute significant carbon abatement with a payback. Highland reports that its Miura LX-100 boiler saves up to \$1,200 per month in fuel costs, even with a 20 percent increase in production, an added keg line that has increased the demand for process steam, and a recent decrease in the price Highland was paying for natural gas.



## Highland Brewing Company....

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Wheeler notes that the MiuraLX-100's low NO<sub>x</sub>/low CO<sub>2</sub> output is directly in line with the company's strong commitment to environmental sustainability. "We are just an hour from the Great Smoky Mountains National Park, and acid rain is a huge concern for us here," he says. "We like to 'walk-the-walk' as well as 'talk-the-talk' about being environmentally responsible, and our Miura boiler helps us do that. This means a lot to us as a company, and we have found that a strong environmental commitment also makes good economic sense. We have saved on our gas bill dramatically with

our Miura boiler. In the year and a half since we've had it installed it has probably already paid for itself in energy savings. We've been able to increase production by a third while reducing our energy costs to less than what they were prior to installing this boiler. The Miura LX-100 has been a great asset for us and I would recommend it to anyone."

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Highland Brewing Company

## Monitoring, Diagnostics, and Control

Every Miura boiler also features Miura's BL Micro Controller, which keeps track of multiple individual monitoring points. An advanced diagnostic system, it can identify any potential challenge to smooth operation and recommend a solution on an easy-to-read display. A "sliding-window feature" records events four seconds before they occur for fast and effective trouble-shooting. This system can also be accessed via the Internet (Miura Online Maintenance, or "MOM") for remote monitoring and diagnostics.

"The monitoring and computer control capabilities of the Miura LX-100 were another important selling point," Wheeler states. "Currently we're just using the BL Micro Controller interface on the boiler, which is very helpful. We may, however, someday want direct monitoring from Miura's Atlanta headquarters utilizing the Miura On-line Maintenance ['MOM'] service. As Highland grows we may also want to install a second Miura boiler and use Miura's MI [multiple installation] controller to link the two together. Even though our boiler room is small, we could put two Miura LX-100s in the same footprint as one conventional 70HP conventional-style boiler."



MIURA AMERICA CO., LTD.  
2200 STEVEN B SMITH BLVD.  
ROCKMART, GA 30153  
(888) 309-5574  
[www.miuraboiler.com](http://www.miuraboiler.com)