



**WATERLOO
MANUFACTURING**
COMPLETE BOILER ROOM SOLUTIONS

Boiler News

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Let us introduce you to the **NEW Cleaver-Brooks** **ClearFire®-LC** **Large Capacity, Full Condensing**

- **Full condensing hydronic boiler**
- **4,000 to 12,000 MBTU/hr**
- **Ultra-low emissions**
- **Up to 98% efficiency**
- **Offers 5:1 turndown**

The revolutionary CFLC line provides maximum flexibility for larger facilities with enhanced efficiency. The larger capacity design allows the most effective installation by using fewer units as opposed to banks of smaller boilers, thus reducing capital cost, complexity, and maintenance. The ClearFire®-LC integrates Cleaver-Brooks leading heat exchanger, burner and control technology into a large capacity condensing boiler solution. The CFLC's integrated premix burner and linkageless control, work together to provide full modulation, ultra-low emissions and optimum turndown. By combining our proven extended heating

surface tube designs, our patented AluFer® tubes and exclusive spiral tubes in a true counter flow arrangement, the CFLC delivers the capacity, efficiency and reliability previously considered unattainable.

When you are the industry leader, the only way to stay there is to continuously innovate. Many of our competitors claim to be innovators, but no one invests more energy and resources into research and product development.

Features:

- Full condensing with up to 98% efficiency and 5:1 turndown
- Ultra-low emissions
- Reduce energy consumption by as much as 40-50% compared to traditional non-condensing boiler systems
- No minimum return water temperature for maximum efficiency and reliability
- Dual temperature returns for system design flexibility
- Up-front capital cost is reduced by installing fewer larger-capacity boilers versus many smaller boilers
- Fully integrated system includes boiler, burner, and controls for multiple lead/lag configuration

Solutions:

- Lower Fuel Cost
- Lower Emissions
- Hot Water Solution

Applications:

- Building Heat
- Education
- Hospital & Healthcare



Clearfire Large Capacity Boiler (CFLC)

Tips to Increase Efficiency and Heat Recovery in a Boiler Room

As boilers age, they become less efficient. Here are a number of ways a facility can increase boiler efficiency to reduce operating costs.

1. **Keep up with Annual Boiler Maintenance** - Maintaining a boiler according to manufacturer recommendations is the simplest way to ensure it will continue to run efficiently.
2. **Proper Water Treatment** - Check that the boiler system water is treated properly. Particulates clog up internal boiler tubes and over time the system loses its heat transfer ability. In most applications, a deaerator is a good solution. It can increase the water temperature to 227°F and remove a lot of the particulates from the water.
3. **Install a High-Turndown Burner** - Increasing the burner turndown rate will increase energy savings and reduce maintenance. Energy savings increases when on-off cycles are reduced. Each on-off cycle is followed by a purge cycle. During a purge cycle, a large volume of air passes through the boiler, resulting in heat being blown out of the stack. Installing a high-turndown burner enables a boiler to consistently run at its most efficient point.
4. **Add VSD Controls** - Installing variable speed drives (VSDs) on boiler feed or deaerator pumps allows an operator to fine-tune the system to run at optimal conditions, while saving energy. This is because VSDs enable a motor to operate only at the speed needed at a given moment.
5. **Incorporate Parallel Positioning** - Adding parallel positioning to a boiler enables it to run at its most capable efficiency point. Parallel positioning uses dedicated actuators for the fuel and air valves. Burners that incorporate parallel positioning are able to maintain excess air levels more precisely.
6. **Include O₂ Trim** - Another way to maintain peak efficiency is to add an oxygen sensor/transmitter in the exhaust gas. The sensor/transmitter continuously senses oxygen content and provides a signal to the controller that trims the air damper and/or fuel valve, maintaining the originally commissioned oxygen concentration under varying conditions. This minimizes excess air while optimizing the air-to-fuel ratio.
7. **Integrate Lead/Lag** - Lead/lag sequences the operation of multiple boilers, matching system load. Lead/lag enables boilers to operate in sync with fluctuating steam loads, reducing the possibility of process failure and needless boiler cycling.
8. **Incorporate Heat Recovery** - Another way to improve energy efficiency is to incorporate heat recovery into a boiler system. Several options are listed below. The right type of equipment for a boiler system depends on several factors, including: boiler type, fuel used, stack materials and operating conditions.

Standard economizer - Economizers transfer energy from the boiler exhaust gas to the boiler feedwater in the form of "sensible heat." Sensible heat is created by the transfer of the heat energy of the exhaust gas to boiler feedwater. An economizer captures and redirects sensible heat from the hot flue gas that normally goes up the boiler stack. This sensible heat increases the temperature of boiler feedwater or makeup water. On average, adding a standard economizer increases boiler system efficiency by 3 percent to 5 percent.

Condensing economizer - A condensing economizer captures both sensible and latent energy from the flue gases leaving the boiler. Two types of condensing economizers are available. There is a standard one-stage condensing economizer, or two-stage condensing economizer. In this two-stage system, the first stage is non-condensing and the second stage is condensing, so the system can heat two sources of water. Adding a condensing economizer increases energy efficiency between 4 percent and 8 percent.

Blowdown heat recovery unit - A blowdown heat recovery unit is the most effective method of purging destructive solids from any steam boiler system. The unit transfers heat energy normally lost during continuous blowdown, transferring it to the cold makeup water. The payback in fuel savings for a blowdown heat recovery unit is typically less than a year.

Flash economizer - A flash economizer uses the surface blowdown to heat up the makeup water. It recovers blowdown energy in the form of flash steam (latent heat) and blowdown (sensible heat). By capturing both sensible and latent heat, a flash economizer is able to recover more heat than the Blowdown Heat Recovery Unit. Payback for a flash economizer often is less than a year.

U-Tube heat exchangers - Water-to-steam or water-to-water u-tube heat exchangers can be added to preheat a boiler feedwater system or deaerator. These heat exchangers operate similar to a blowdown heat recovery unit. U-tube heat exchangers can be used just about anywhere to transfer heat between a hot fluid and a cold fluid.

Payback calculations can help companies predict the annual cost savings for making certain energy-efficient upgrades. One such software program is BOOST™ (Boiler Operation Optimization Savings Test), available through Waterloo Manufacturing Company Limited, your Cleaver-Brooks representative.

For information on products and services please contact us at:



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