

Bryan “Flexible Water Tube” Boiler Comparison Guide

Flexible Tube Steel Boilers

Firetube Steel Boilers

Cast Iron Boilers



B BRYAN® BOILERS

Originators of the “Flexible Water Tube” design





Boiler Comparison Guide

| | Bryan flexible water tube steel boilers | Firetube steel boilers | Cast iron boilers | Competitive water tube boilers |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------|-------------------|--------------------------------|
| Installation Minimal assembly required for new building installations Will pass through standard doorway in existing buildings Right hand or left hand construction | x x x | x | x x | x |
| Estimated years of service life | 35 to 40 | 25 | 35 | ? |
| Full 5 sq ft heating surface per boiler HP or more | x | ? | ? | ? |
| Space Requirements Minimal floor space needed to set and service | x | ? | x | ? |
| Maintenance No major disassembly required for cleaning No welding or rolling required to remove and replace tubes No repairs to damage caused by thermal shock 25 year non-prorated warranty | x x x x | | * | x |
| Efficiency Highest operating efficiency based on combustion efficiency and burner motor horsepower Close match to specific load based on numerous sizes available Size range from 6 HP through 500 HP | x x x | ? ? x | ? ? ? | ? ? ? |
| Fuels Oil, gas or gas/oil Atmospheric gas Each of above available with electric if desired | x x x | x | x x | x |
| Specialty applications Large buildings High-rise buildings regardless of boiler location Process steam, high pressure Process steam, low pressure Low temperature return water application not requiring external pump | x x x x x | x x x x | x x x | x x x x |

* Replacement of sections requires extensive labor and downtime.



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Selecting the Proper Boiler

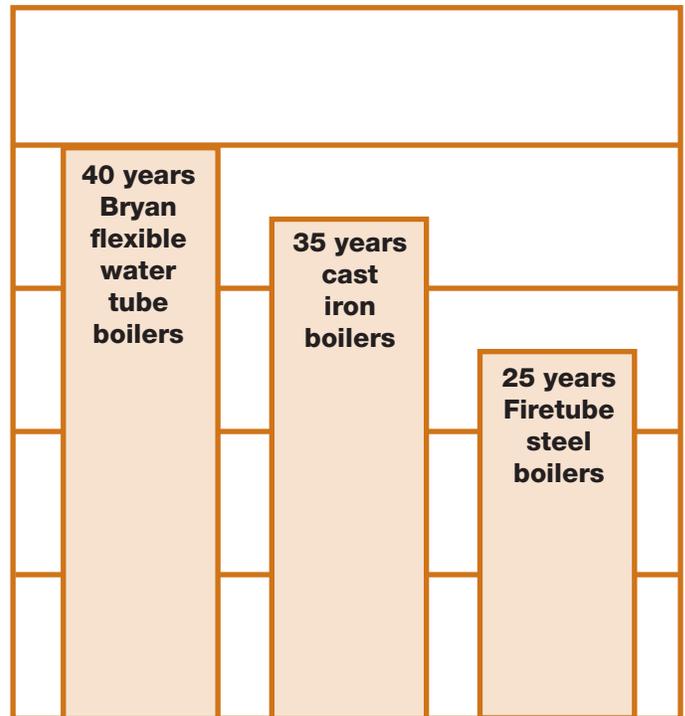
If you're an engineer, an architect, a mechanical contractor or a building owner, selecting or specifying the right boiler is probably one of your many concerns. Steel? Cast iron? Watertube? Firetube? With all the conflicting opinions, reports and literature in circulation, it's no easy task.

At Bryan, we understand the problem. That's why we've put together this guide. It's a summary of how our flexible water tube boilers compare to firetube, cast iron and other water tube boilers in several important areas. We think you'll find it helpful.

Economy

Installation costs. Because cast iron boilers come as sectional units, substantial time-consuming assembly is required. Steel boilers are shipped completely finished and may require that walls be opened in existing buildings or new buildings which have already been enclosed. Bryan flexible water tube steel boilers, however, are prepackaged units that may be easily disassembled ("Knockdown™") to precisely the degree necessary.

Service life. The best estimates we have on boiler life expectancy are thirty-five years for cast iron units and twenty-five years for firetube steel models. With many boilers still on the job after forty to fifty years of service, Bryan's flexible water tube steel design has demonstrated longevity equal to or better than that of either alternative.

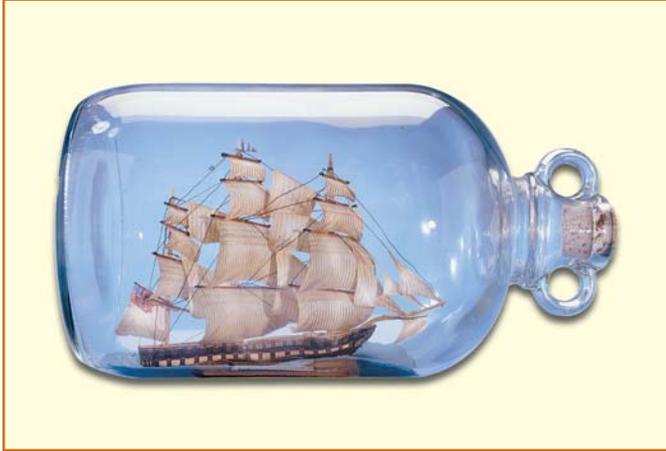


Boiler Longevity*

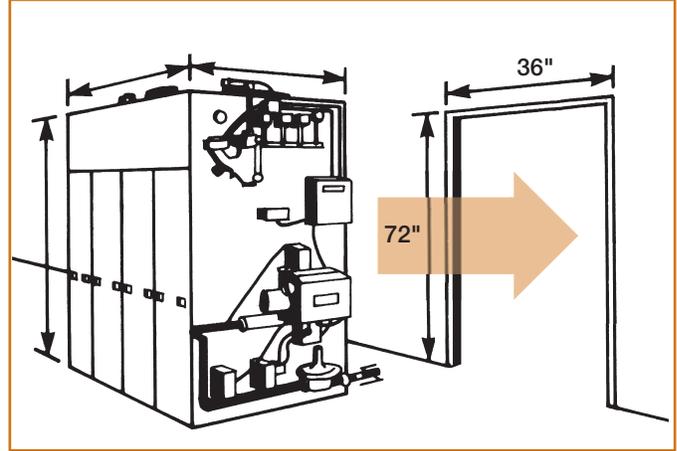
*Competitive flexible tube boilers not shown due to inadequate experience.



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How to put a new boiler through a 26 x 56 inch opening.



Bryan Knockdown™ construction allows entry into existing buildings. You simply choose the degree of knock down needed.

Convenience

New building installation and assembly. While sectional cast iron boilers often cause storage problems and the loss of parts by arriving at the job site in several pieces at different times, Bryan flexible water tube steel boilers are shipped as complete, prepackaged units. That means the boiler arrives at the job site assembled and ready for installation. In addition, Bryan boilers may be shipped with or without tubes installed and, unlike cast iron units, do not require any complicated assembly.

Replacement installations in existing buildings. The opening of a wall required to replace an inefficient or worn-out boiler with an assembled steel boiler is a troublesome, costly and time-consuming operation. Most Bryan flexible water tube steel boilers, however, feature Knockdown™ design which allows the unit to be easily disassembled in stages. If necessary, the boiler may be knocked down so it can be carried through entryways smaller than a standard door.

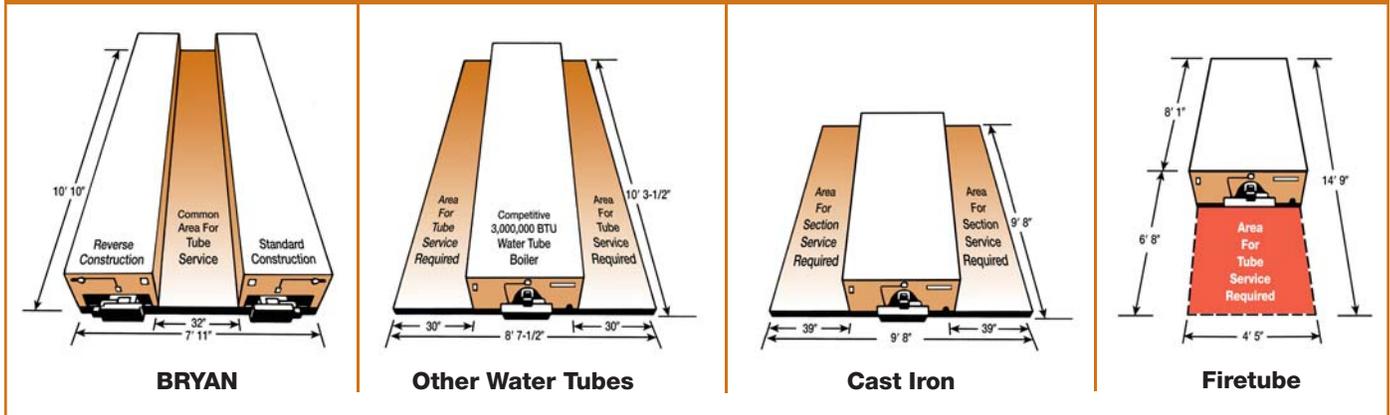


Space saving standard and reverse construction allows Bryan boilers to share common service space as in this renovated boiler installation in a middle school.



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Space Requirements – 3,000 MBH Boiler



Competitive water tube boilers can require twice as much space for service for half as much capacity. Bryan's standard and reverse combination make it the best investment.

Cast iron boilers require a section width area for service, equals wider foot print.

Firetube boilers require floor space equal to boiler size for tube removal.

Space requirements. Bryan flexible water tube steel boilers generally require less floor space than comparable cast iron units. The bent tube, removable from only one side, requires approximately 24 to 32 inches of service area, the same as most cast iron boilers.

With a firetube steel boiler, the floor space used by the unit itself must be doubled in order to accommodate tube replacement.

An additional space-saving benefit of Bryan flexible water tube steel boilers is reverse construction. This optional design allows two boilers to face each other, thus sharing the same service area and saving space in the mechanical room.

Cleaning. Generally speaking, easy access makes Bryan flexible water tube steel boilers more convenient to clean than either cast iron or firetube units.

Removing a Bryan boiler's jacket access door and tube panel exposes the entire bank of flexible water tubes. An ordinary flue brush and vacuum cleaner are all that is needed for complete cleaning.

Maintenance. With cast iron or firetube boilers, replacing the unit or tubes often means complete disassembly, welding, rolling and an outside contractor. The water tubes in a Bryan flexible water tube steel boiler, on the

other hand, can be replaced by a general maintenance worker in about thirty minutes.

Replacement tubes are available from Bryan representatives within twenty-four hours. And, most temporary tube repairs may be made in minutes allowing operations to continue until replacement tubes arrive.



Bryan design provides easy access for the service and maintenance of tubes and burner.



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Our Efficiency is Guaranteed

Favorable or superior operating efficiencies are frequently reported for all types of boiler, particularly in advertising and promotional materials. Most often, these claims are based on factory laboratory tests.

Bryan flexible water tube steel boilers achieve 86% efficiency in operation on actual job sites with normal 140° - 160°F return water temperature.

It should be noted that differences in efficiency will always occur between water boilers and steam boilers or gas-fired boilers and oil-fired boilers.

For instance, a Bryan oil-fired hot water boiler can be expected to operate in the 85% to 86% range, and a forced draft gas hot water model in the 85% range. Again, these are on-the-job efficiencies rather than factory laboratory results.

The Bryan flexible water tube steel boiler is offered in ratings from 6 to 500 hp. This wide selection also helps promote higher efficiency by allowing you to select a boiler to match your requirements more closely.

Versatility

Multi-boiler installations and expansion. Because Bryan flexible watertube boilers are available in capacities from 6 to 500 hp, they are well-suited for multi-unit installations.

When more than one boiler is used — whether due to expansion or in an original installation — Bryan can supply a lead/lag demand analyzer system that protects efficiency by enabling the owner to sequence only those boilers required to meet the current load demand.

Fuel and firing options. Bryan flexible water tube boilers are offered with either forced draft or atmospheric gas firing. Either mode is available for use on multiple fuels; natural/methane/propane gas and oil or combination gas/oil.

In addition, the optional Bryan Energy Selector provides oil and/or gas firing or alternate electric power at the flip of a switch. This versatile feature is not available in cast iron or firetube boilers.



Bryan lead/lag demand analyzer.



Bryan's Energy Selector lets user choose gas, oil or electric firing with the flip of a switch.



Boiler Comparison Guide

Specialty Applications

High-rise buildings. Cast iron boilers are generally limited to operating pressure around 80 pounds. Bryan flexible water tube boilers, however, can be provided for working pressures up to or exceeding 150 psi, making them ideal for high-rise buildings.

Steam process applications. Unlike low pressure cast iron boilers, Bryan boilers are also available for nearly any steam process application from 15 to 300 psi.

Steel boiler water heaters. All Bryan flexible tube steel water boilers can be ordered with single or

multiple indirect copper heat exchangers for a variety of water temperatures.

This option gives you the flexibility to include your service or process water needs in a single unit, in most cases, regardless of the application. Such an arrangement reduces costs and saves mechanical room space.



Bryan Benefits

Selection. In the full range of sizes to 500 hp, nobody sells more water tube steel boilers than Bryan Steam.

American-made reliability. Bryan Steam's Peru, Indiana, manufacturing facility is one of the most advanced boiler plants in the nation. All boiler parts are made at this facility enabling Bryan to apply exacting quality assurance standards in every stage of the manufacturing process.

To assure fast service, Bryan keeps many packaged boiler units in stock at the factory. All are available with your choice of options, ready for immediate shipment.

A reputation for quality. Industry surveys repeatedly show Bryan Steam flexible steel water tube boilers as the predominant choice of leading engineers and architects.

After more than 90+ years of providing the HVAC industry with the finest boilers available, Bryan Steam has a quality assurance and field service program second to none. When you own Bryan boilers, more than 120 experienced factory-trained sales and service representative organizations located throughout the world are always available for consultation and assistance.

Companion Products & Accessories

Companion products and accessories. Bryan's complete line includes these dependable, performance matched accessories. Design your complete system using Bryan components for maximum reliability and value.

Condensate return and boiler feed pump systems. These are available for use with any steam boiler, both low and high pressure. Standard in simplex, duplex or special arrangements for multiple boiler installations are available. Tanks constructed of heavy-duty steel.

Bryan deaerators. Remove dissolved gasses from incoming make-up water with minimal steam loss.

Deaerate to a maximum .005 cc/liter O₂ and 0% CO₂. Spray type deaerators available through 60,000lb/hr. Tray type deaerators have stainless steel trays, are available in standard capacities from 5,000 to 300,000 lb/hr.



Hot water storage tanks. Bryan offers standard tanks in capacities up to 5,000

gallons, diameters to 84", operating pressures from 30 to 250 psi. Protective linings, both phenolic and cement are available. Insulated metal jacket optional.

Bryan exhaust heads. For oil-free and water-free exhaust of steam. After 100 years, still the most reliable design available. Flanged or threaded models from 1" to 5", as well as flanged sizes to 24".



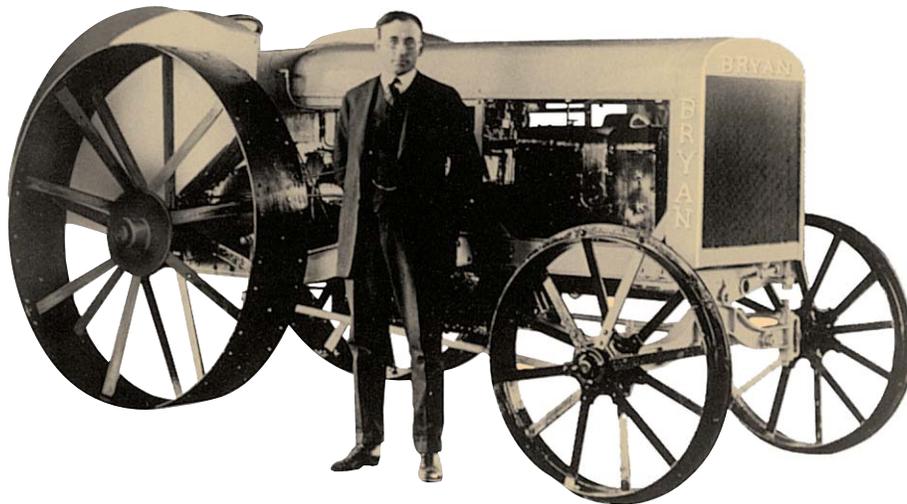
Blowdown separators and tanks. Used during blowdown of system to separate steam from water, allows dry steam to be vented to the atmosphere. Water may be cooled if necessary to prevent thermal pollution.

Bryan overflow traps. Mechanical float controlled traps with cast iron bodies, double sealed brass valves, stainless steel ball floats. Sizes from 2" to 6" for use on pressurized deaerators.

Bryan Steam

Since 1916— pioneer and leader in flexible water tube boilers

In 1916 a locomotive engineer and steam power enthusiast named George Bryan founded the Bryan Harvester Company, a small manufacturing firm which produced steam powered tractors. The rising popularity of the gasoline engine forced Bryan to abandon the steam tractor in 1922, but it was not forgotten. The bent water tube boiler which powered the tractor was extremely rugged, impervious to thermal shock, compact, and easy to service, making it ideal for other applications. Bryan Harvester became the Bryan Steam Corporation and began refining and marketing that original boiler for an array of uses. Today, Bryan Steam LLC continues to incorporate many of the features found in the original Bryan Boilers. Applying the advantages of past experience to projects for the future has made Bryan the leader in the production of flexible water tube boilers for more than three quarters of a century.



Bryan Steam LLC—Leaders Since 1916

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