

Johnston Boiler Company

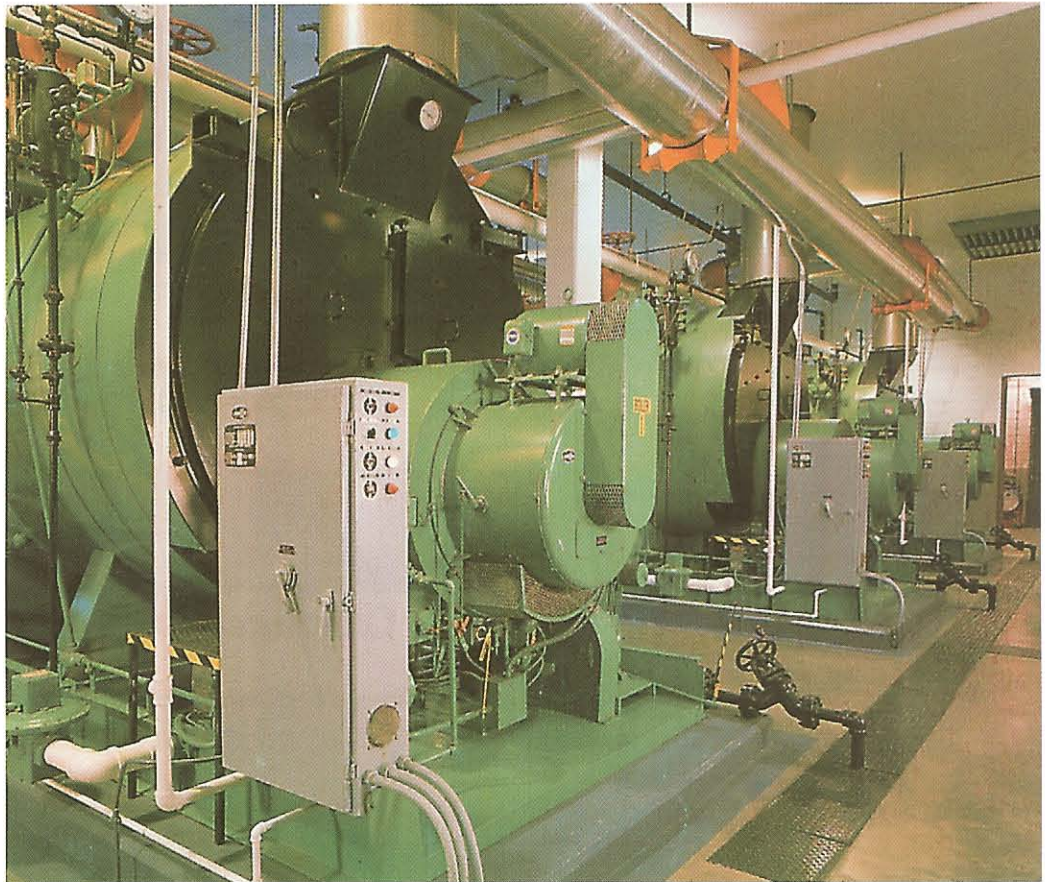
3 and 4 Pass Boilers

Model PFT Boilers

50 HP – 2500 HP

1,725 PPH – 86,250 PPH

15 PSIG – 350 PSIG



Johnston Boiler Company
300 Pine Street • P.O. Box 300
Ferrysburg, MI 49409-0300
Tel: (616) 842-5050 • Fax: (616) 842-1854
Net: www.johnstonboiler.com

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Product Standards for over 100 years.

Quality.

Longevity.

Minimum Maintenance.

Maximum Efficiency.

Johnston Boiler Company pioneered the first water backed boiler over 100 years ago, and the first packaged water backed boiler over 50 years ago. Johnston features a complete packaged boiler that needs just the essential utility and discharge hook-ups before supplying your steam or hot water needs. The complete package is thoroughly factory fire tested at all applicable loads and fuels prior to painting and shipment.

Depending on design and operating pressure, efficiencies reach 90% – the highest in the industry without turbulators or an economizer. Minimum use of refractory and the full water back design reduces maintenance while at the same time enhances pressure vessel longevity.

From front to back, top to bottom, every Johnston “J21” or “509” series boiler comes with an unprecedented – industry leading 15 year warranty covering the tube sheets, furnace, rear combustion chamber, and flue doors – materials and labor.



Product Features



RM 7800 Control Panel

The standard NEMA 12 control panel contains on/off pushbuttons or switches, manual flame potentiometer, relays, the Honeywell RM7800 flame safeguard, and a 4" alarm horn with silencing switch.



No Proprietary Trim

The majority of Johnston Boiler controls are "off the shelf" items which eliminates stocking of proprietary parts and lengthy down time in the event of control malfunctions.



The Factory Test

Each customer ordered package is completely fire tested from low fire to high fire verifying safety control shutdowns, burner performance and fuel/air ratio to assure product performance as specified.



Custom Engineered/ Custom Built

Every Johnston Boiler is specifically engineered and built to every customer's needs and specifications. Special sizes, fuels, and auxiliary equipment are "no problem" with Johnston.



Ease of Fireside Inspection

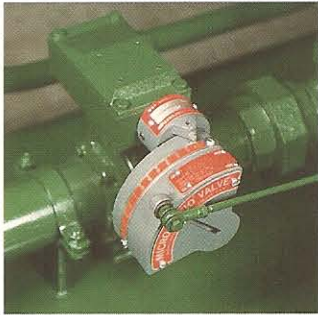
Front and rear doors are hinged and davited to provide simple opening and minimum clearance for full access to fireside tube surfaces, which eliminates the necessity of disconnecting the burner and fuel piping.



Waterside Inspection

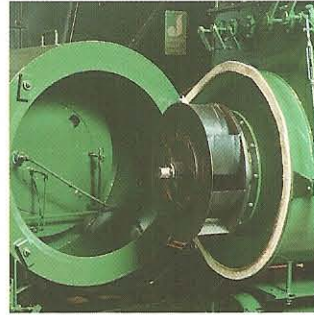
Handholes are furnished in the front and rear heads so area below the furnace can be observed for sediment and mud accumulation. A manhole is located in the upper portion of the rear head (front head on 3 Pass) for easy inspection and waterside access.

Product Features



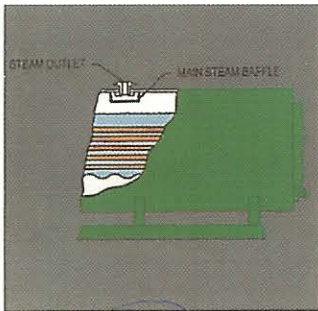
Fuel Flow Control Valves

Contoured cam valves provide reliable fuel to air ratio set points from low fire to high fire assuring the best burner efficiency.



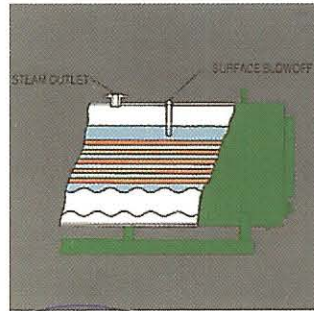
Fan

Swing-away hinge mounted fan assembly permits easy access to centrifugal fan and burner internals without having to disconnect fuel lines, burner or entire boiler front (100-1600 HP).



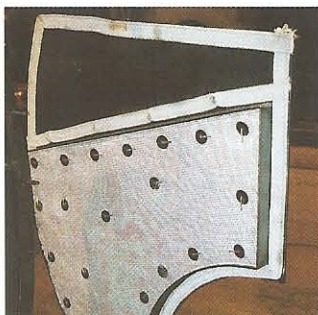
Steam Baffle

On all steam boilers, an integral baffle is located below the nozzle outlet and assures dry steam for process load applications.



Surface Blowoff Tap

Each boiler is equipped with a top mounted continuous surface blowoff tapping with integral diptube for connection to a surface metering valve to maintain proper TDS water quality.



Minimal Use of Refractory

Johnston uses a durable, lightweight ceramic fiber blanket in all front and rear flue doors. This saves on expensive refractory door repair and in addition, our flue doors carry a 15 year parts and labor warranty.

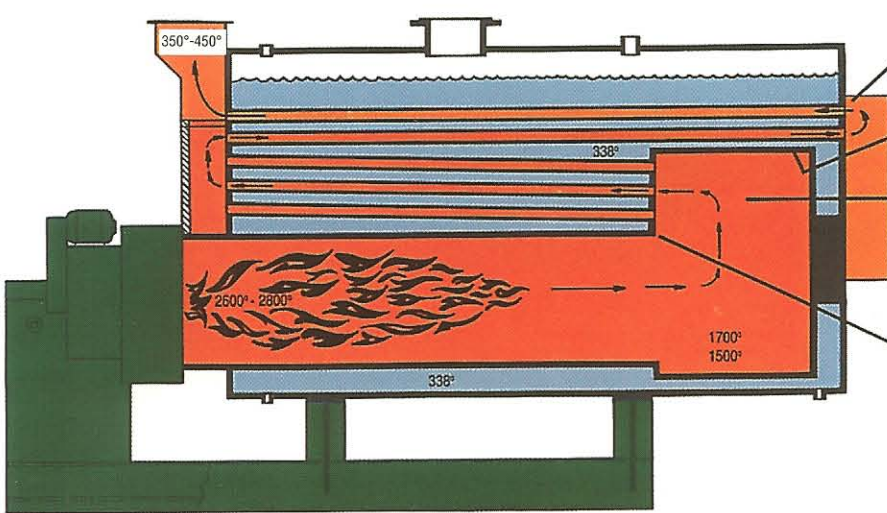


Insulation & Jacket

A minimum of 2 inches of fiberglass blanket is used on the entire pressure vessel shell and rear head. This insulation is covered with a galvanized non-corroding steel jacket. Segments are attached with a locking seam joint and self-tapping screws.

4 Pass Design

Johnston maximizes boiler performance design to minimize operations maintenance.

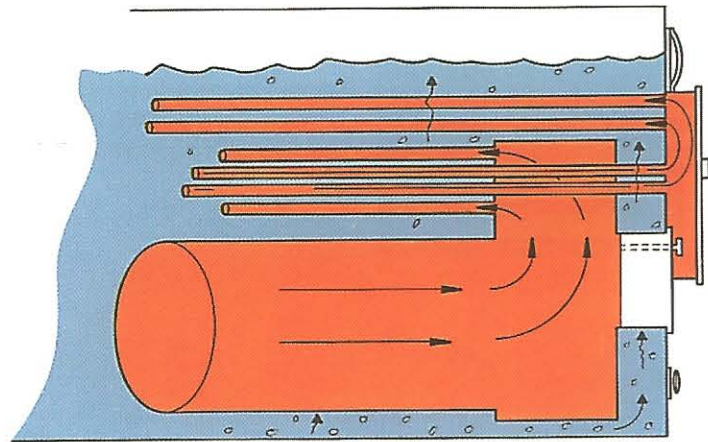


Rear tube sheet has only one inside and one outside surface temperature – no ligament cracks.

No baffles – no refractory – no radiant heat or steam bubbles to wire draw tubes.

Combustion chamber is part of pressure vessel subjecting it to code construction. – Improves internal water circulation – increases water content, steam storage space and steam liberating surface.

Combustion chamber tube sheet has only one inside and one outside surface temperature – no ligament cracks.



For many years, there were two choices – a 4 pass dry backed boiler or a 3 pass water backed boiler. This was a hard decision for many users. A 4 pass would have a higher efficiency, but higher maintenance costs associated with frequent refractory repair. While the 3 pass water backed required less maintenance, a decrease in efficiency could be expected.

In 1978, that all changed when Johnston introduced the first pack-

aged 4 pass water backed boiler. Now, a customer could have the best of both worlds – water backed reliability with 4 pass design efficiency.

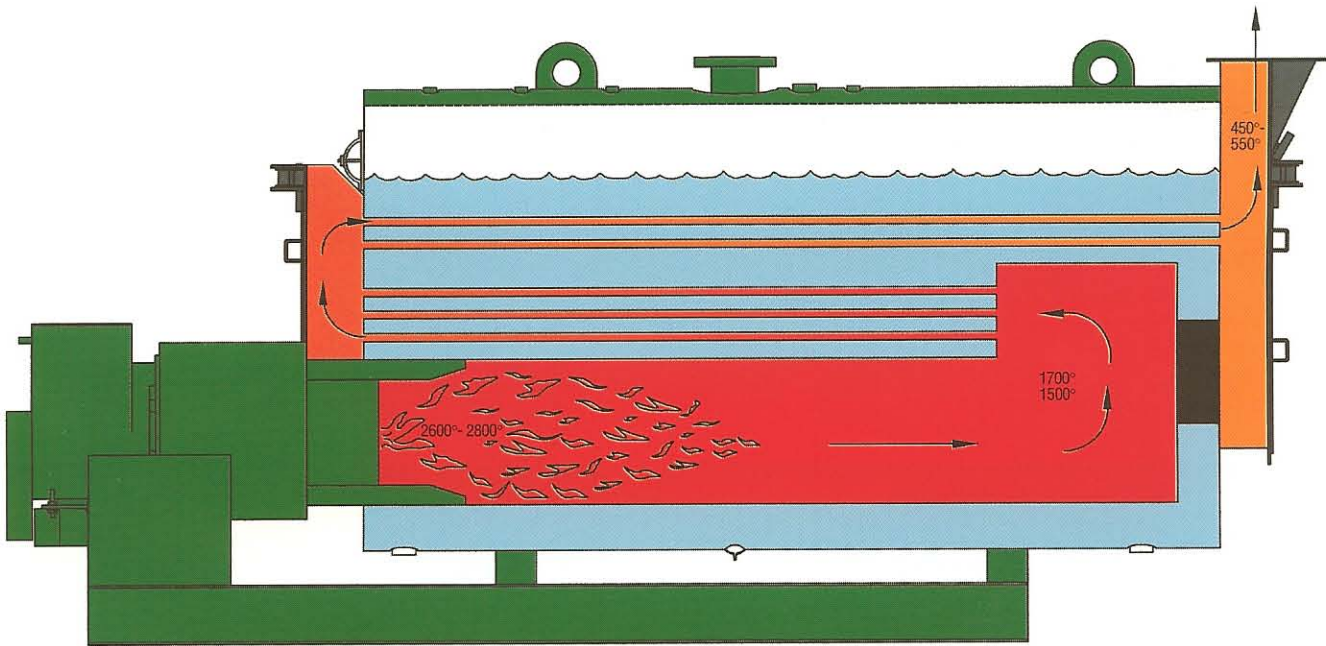
Every Johnston 4 pass maximizes effective heat transfer using a full five square feet of heating surface per BHP while at the same time eliminating tube sheet stresses and costly maintenance repairs that are common with dry backed designs.

Many boiler users over the years have seen the benefits of using a Johnston. Low maintenance costs, high reliability, high performance and lower fuel costs have paid back their initial investment many times over.

For an estimation on how a Johnston boiler can save your business bottom line dollars, contact your local Johnston representative.

3 Pass Design

The Johnston 3 pass boiler –
unsurpassed quality, value, and durability.



When Johnston introduced the first 3 pass water backed firetube boiler to the market back in 1934, it changed the boiler industry forever.

Today, the Johnston 3 pass boiler is still a strong and dominate force in the boiler industry with its high steam and water storage areas, high efficiencies, rugged construction, and its ability to keep up with wide load demands.

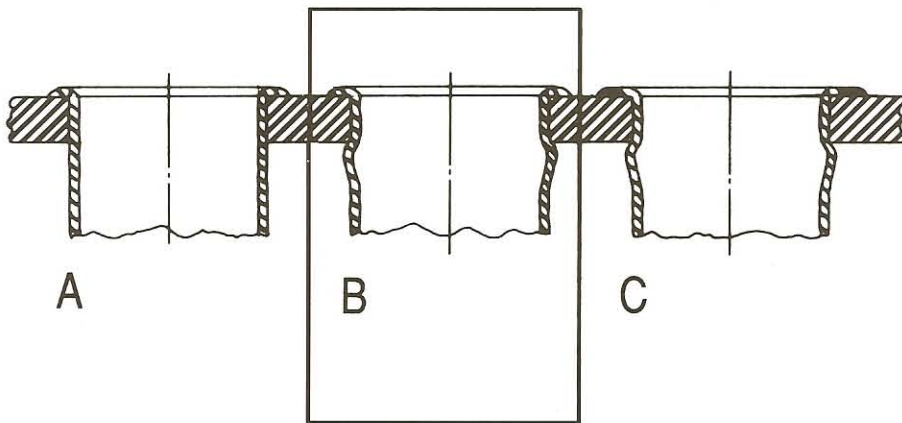
The Johnston 3 pass also offers something the competition doesn't – watertube capacity with firetube efficiency. Up to 2500 BHP (86,250 PPH) is available, while maintaining the Johnston water backed quality the industry has grown to respect.

Like the 4 pass, the 3 pass incorporates a design that maximizes heat transfer while minimizing the use of refractory – no expensive door repairs.

Both the 3 and 4 pass models offer the same 15 year limited pressure vessel and 15 year front and rear flue door warranty.

Lower maintenance costs, fuel savings, and long term durability are all major factors in choosing the right boiler for your project. We encourage you to compare our boilers to the competition. In the end, there is no equal to the original – Johnston.

Tube Attachment



Tube Attachment

A *Expand Roll and Bead*

Method most commonly used by boiler manufacturers – allows linear movement in tube socket when tube expands. Requires periodic re-rolling for tightness.

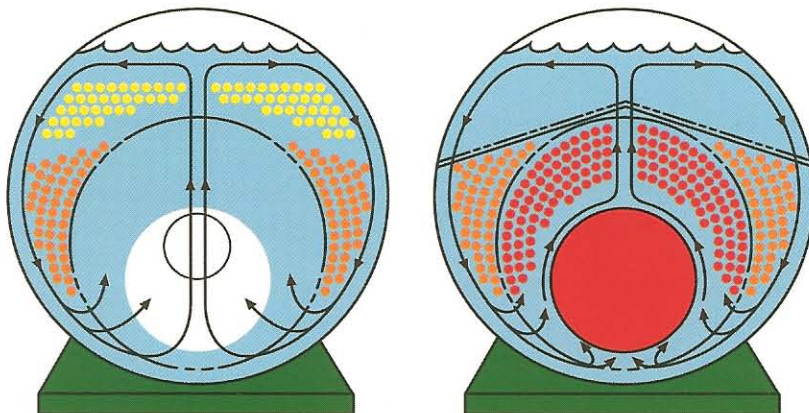
B *Prosser, Expand Roll and Bead*

Johnston process—locks tube on both sides of tube sheet—prevents movement—eliminates re-rolling.

C *Prosser, Expand Roll, Bead and Seal Weld*

Johnston optional process—for additional rigidity. Tube can be removed without disturbing socket.

Water Circulation



Water Circulation

While efficient fireside heat transfer is important for high efficiency, efficient water circulation is equally important – adding to performance output. Johnston's tube layout and water backed first pass turn around area promotes excellent water circulation. A specific space above the furnace separates right and left tube banks permitting the upward thermal flow of water from the furnace. Behind the furnace chamber, space is allowed for upward movement of water while cooler water flows to the outer sides of the boiler, down the sides and again rises to the surface as it is heated. This design provides a true natural circulation effect.

Packaged Convenience



Gas Piping Train

Factory mounted, wired and tested U.L. gas train is furnished standard with 2 pressure gauges, shutoff cocks, safety shutoff valves, and a fuel input control valve. Gas trains can be equipped to meet other standards such as NFPA 8501, IRI, FM, and other specific insurance or job specifications.

Oil Piping Train

Burners equipped to operate on distillate fuels from 2 through 6 oil are factory furnished with a fuel input control valve, safety shutoff valves, a pressure regulator, pressure gauge, suction strainer and oil pump. For heated oils, an electric preheater and steam or water heater are furnished.

Auto Operation

Johnston controls and burners are mounted at the front of the boiler – all conveniently located for operator servicing, adjustment, or inspection.

The standard NEMA 12 power panel contains starters, fuses, and a control transformer. The standard NEMA 12 control panel contains on/off push-buttons or switches, manual flame potentiometer, relays, and the Honeywell RM7800 flame safeguard.

All burners used on the “J21” or “509” series are of the full modulation design responding automatically to system demand via single point positioning controls. A single damper motor is linkage connected to the fuel input control valves and as the boiler modulating pressure or temperature control senses a change in system load, the firing rate of the burner is automatically adjusted to meet the new requirement. Burners are capable of turndowns of up to 10:1.

The complete package is built in accordance with the latest ASME code requirements, National Electric Code, and other required local and state code and insurance requirements.

What is Fuel to Steam Efficiency?

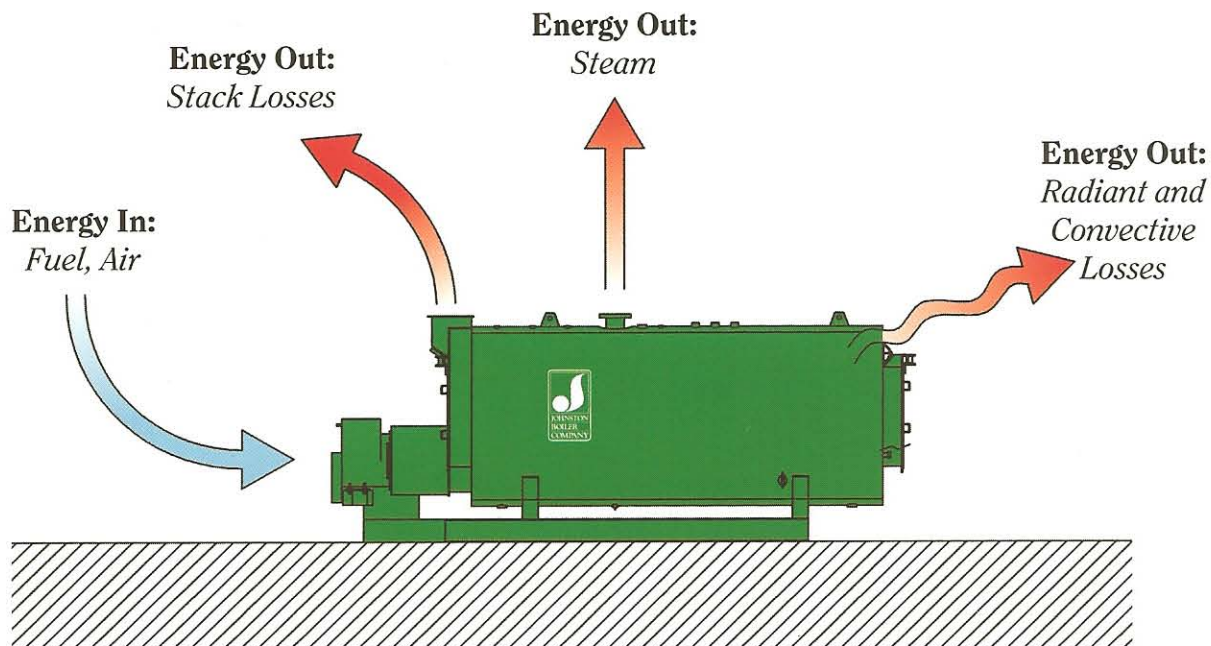
There are many things in everyday life that we measure quantitatively: the local municipality measures how much water we use; the gas station measures the amount of fuel we pump into our vehicles; and we buy produce at the grocery store by the pound. Though we can't always see it, energy is also a quantity that can be measured. This discussion presents an overview of fuel to steam efficiency by looking at the movement of a quantity of energy that enters a boiler and what it means to your bottom line as the owner of that boiler.

When you purchase fuel for your boiler in the form of natural gas, oil or propane, you are really purchasing energy. This energy is introduced to the boiler during the combustion process in the form of heat. The goal of a boiler is to produce as much steam with that heat as possible; all lost heat is actually

the loss of your purchased energy. There are only three places for the input heat energy to go: it may exit as a useful quantity in the steam; it may be lost to the boiler's surrounding environment; or it may be expelled into the atmosphere as a component of flue gases.

Note that we mention only two ways in which heat may be lost: to the environment and through the stack. First, let's look at losses to the immediate surroundings. We call these radiant and convective losses. If you stand next to a running boiler, you can feel some of these losses. In fact, an operating boiler is often too hot to touch. In reality, the heat lost here is only around 1 percent. The majority of the lost heat is expelled via the second method, as a component of the flue gases that exit the boiler.

The measurement that the boiler industry uses to specify the amount of input energy used is called fuel to steam efficiency. All Johnston Boiler efficiencies are calculated using the ASME Power Test Code PTC 4.1. This takes into account the amount of energy exiting the boiler in the steam and the amount of energy entering the boiler in the fuel. The greater the efficiency, the smaller the quantity of energy that is wasted. What this means to your bottom line as a boiler owner is that efficiency is an indication of how much money it will cost you in fuel to produce the steam that you need for your application. A small increase in efficiency may lead to a savings of thousands of dollars in fuel costs in a single year!



JOHNSTON BOILER COMPANY MAJOR PRESSURE VESSEL COMPONENTS TUBE SHEETS, FURNACE, AND REAR COMBUSTION CHAMBER WARRANTY CERTIFICATE FIFTEEN (15) YEARS PARTS & LABOR

Johnston Boiler Company (the "Company") provides this limited Extension of Warranty to _____ with respect to the Company's "J21" and "509" Series Packaged Firetube Boiler (the "Boiler"):

If, within fifteen (15) years, from and after the date of shipment of the boiler to the original Purchaser; the tube sheets, furnace, or rear submerged combustion chamber fail under normal use and service, the Company will repair or replace the part or component as required for proper operation of the Boiler.

This warranty shall be voided by any repair, alteration, or modification of the Boiler or any part thereof by persons other than employees of the Company or those expressly authorized by the company to make such repairs, alterations, or modifications, or by any abuse, misuse, neglect or improper maintenance of the Boiler or by use thereof under abnormal operating conditions or not in accordance with the Company's published instructions. This extension of the warranty period shall apply only to the covered components; all other components of the Boiler shall be subject to the standard warranty set forth in the Company's Quotation and/or Acknowledgment Forms, as applicable. The remedies for any failure of the covered components to meet the warranty specified herein shall be those remedies including limitation as set forth in the Company's terms and conditions, a copy of which is included with this proposal. This Limited Extension of Warranty shall be to the benefit of the original purchaser of the Boiler only, and is not assignable without the Company's written consent. EXCEPT AS PROVIDED HEREIN AND IN THE COMPANY'S STANDARD QUOTATION AND/OR ACKNOWLEDGMENT FORMS, THE COMPANY MAKES NO WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. THE COMPANY SHALL IN NO EVENT HAVE ANY LIABILITY WHATSOEVER FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

As of printing, all information enclosed in this brochure is accurate. However, Johnston Boiler Company reserves the right to change products or warranties without notice in order to continually upgrade our products.

Boiler Room Installations



*Central High School – Saginaw, MI
(2) 150 HP
Natural Gas Burners, Hot Water Generators*



*Acco Chain and Lifting Products – York, PA
(2) 750 HP
Natural Gas/Propane Burners, High Pressure Steam*



*Merchandise Mart – Chicago, IL
(2) 750 HP, (1) 500 HP, (1) 150 HP
Gas/Oil Burners, Low Pressure Steam*



*Pilgrim's Pride – Mt. Pleasant, TX
(1) 2000 HP, (1) 1200 HP, (3) 800 HP
Natural Gas/Fume Burners, High Pressure Steam*

DISTRIBUTED BY:



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