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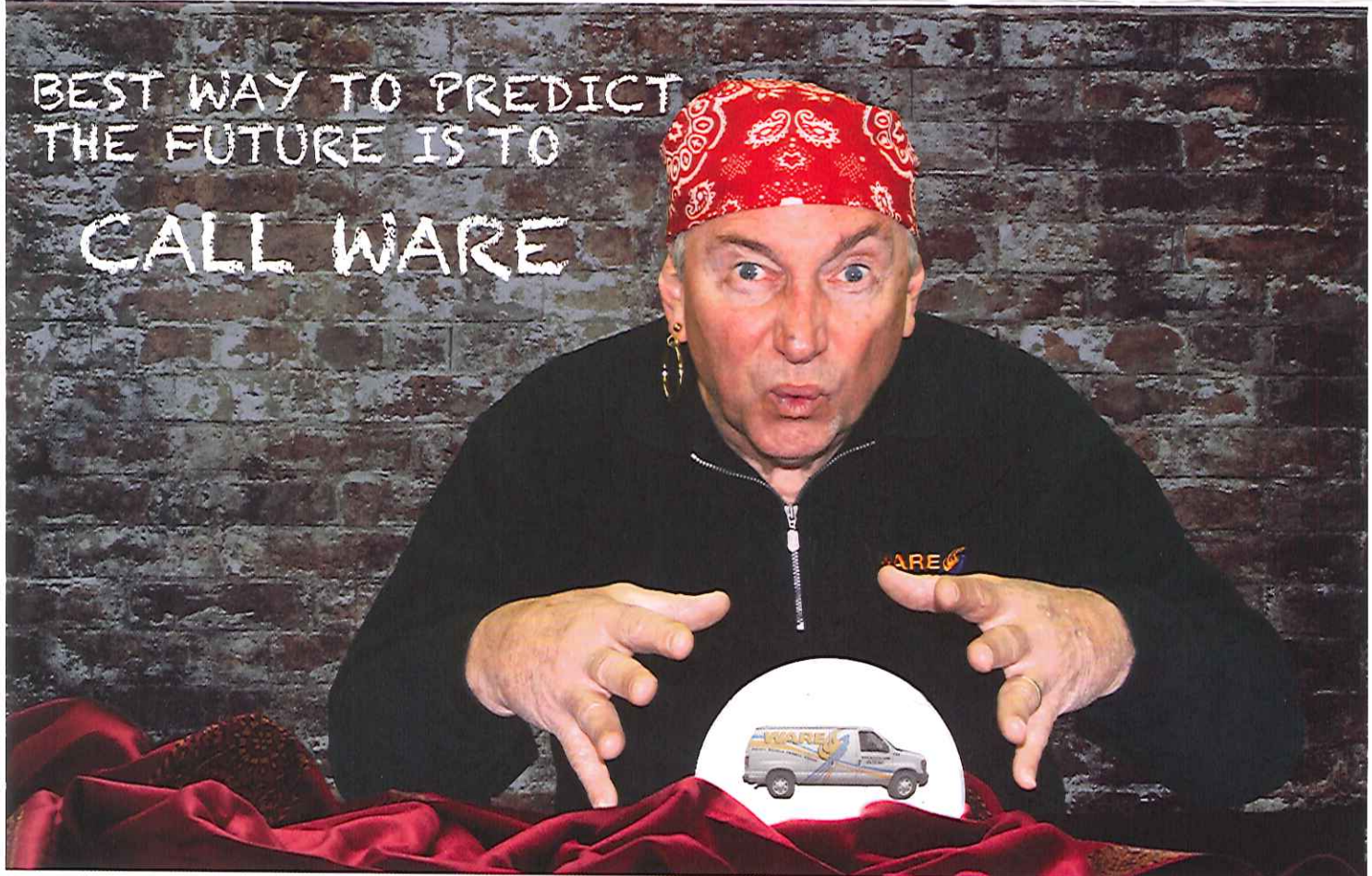


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The GRIME

June and July 2014 Newsletter

Boiler Design: More Passes Does Not Mean More Efficiency

Here at The Grime, our goal is not simply to inform you of what's going on here at WARE, we also strive to provide education about the intricacies of boiler engineering and product design. There seems to be a current market misconception that more passes in a boiler equals more efficiency. However, this is not always the case.

Boiler efficiency is a measure of how efficient a boiler is in converting its fuel to energy. A boiler operating at 85% efficiency is able to convert 85% of its fuel into energy for use in a plant. The other 15% is lost through radiation and convection processes.

A boiler with more passes provides more opportunities for hot gasses to transfer heat to the water in a boiler. So while it seems easy to say that a 3-pass boiler is more efficient than a 4-pass boiler, it's not that crystal clear.

Boiler efficiency is highly affected by tube design. If the design, tubing, and all other components of a boiler are equal, then yes, a 4-pass boiler will generally be more efficient than a 3-pass boiler. This is because a 4-pass boiler has a greater heat transfer time. However, a 3-pass boiler that uses a tube design that allows more heat transfer time can have an equal or higher efficiency rating than a 4-pass boiler with standard tubes.

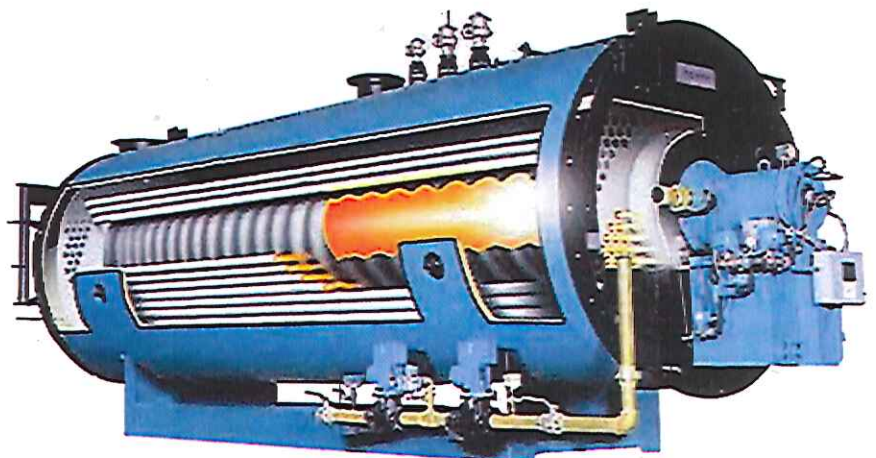
A 3-pass design allows the boiler to do more work in the furnace because of its larger heating surface area. In fact, in a York-ShIPLEY 3-pass boiler, 55% of heat input is transferred in the furnace. This type of process makes steam sooner and leads to faster steam production. In comparison, a 4-pass boiler transfers 40% of heat input in the furnace. A 4-pass boiler design tends to be shorter than a 3-pass boiler design. 4-pass boilers do more work in the convective section (60%) as opposed to the furnace, where the fire is actually at. 3-pass boilers

do 45% of their work in the convective section. Ideally, a boiler would be a 1 pass design. However, this would simply be too long to be practical.

3-pass boilers use a downdraft design that places the coolest water in the coolest part of the boiler. This keeps the cooler water from having an effect on the hot surfaces within the boiler. Conversely, 4-pass boilers operate with a natural draft, but because of this, they allow cool water to contact the hottest part of the boiler.

At WARE, we use X-ID Tubing in order to provide increased efficiency in boilers with less passes. X-ID Tubes are tubes used within the boiler that have ribs embossed inside of them. These ribs are engineered to a specific height in order to get heat tumbling through the tube and create more productive heat transfer. We do as much work as is practical in the furnace, and then use X-ID in the remaining tubes in order to absorb heat more rapidly in the remaining sections.

More does not always mean better, especially in terms of boiler design. More tubes may seem to imply more efficiency, however, it's about quality, not quantity. Recent innovations in tube design enable 3-pass boilers to be just as efficient as 4-pass boilers.



WARE IS GAINING GROUND AS A NATIONWIDE STEAM RESOURCE

WARE is generally known around the country as “the boiler people.” There is a good reason for that: we are the boiler people. However, we are also becoming “the steam people” throughout the nation. We have been working with our Valve division to move outside of the boiler room and focus not only on boilers and combustion, but on steam systems as well. Through doing what we call “Steam Studies” we are able to follow the steam footprint throughout different plants, determine how steam is utilized throughout a plant and ultimately how to reduce cost and increase efficiency for the customer. The combined knowledge and services at WARE are quickly making us the one-stop resource for anything steam.

Our Steam Studies are able to reveal problems within the steam system that may be inherent to the structure of the plant and define where exactly these problem areas are. A comprehensive report is provided based on our testing and observations of the system and includes recommendations for improvement to the system and components. In addition, we are able to determine how much these issues are costing the company, provide the company with a list of the issues, and educate them on the order in which to fix those issues. This process can increase the customer’s product

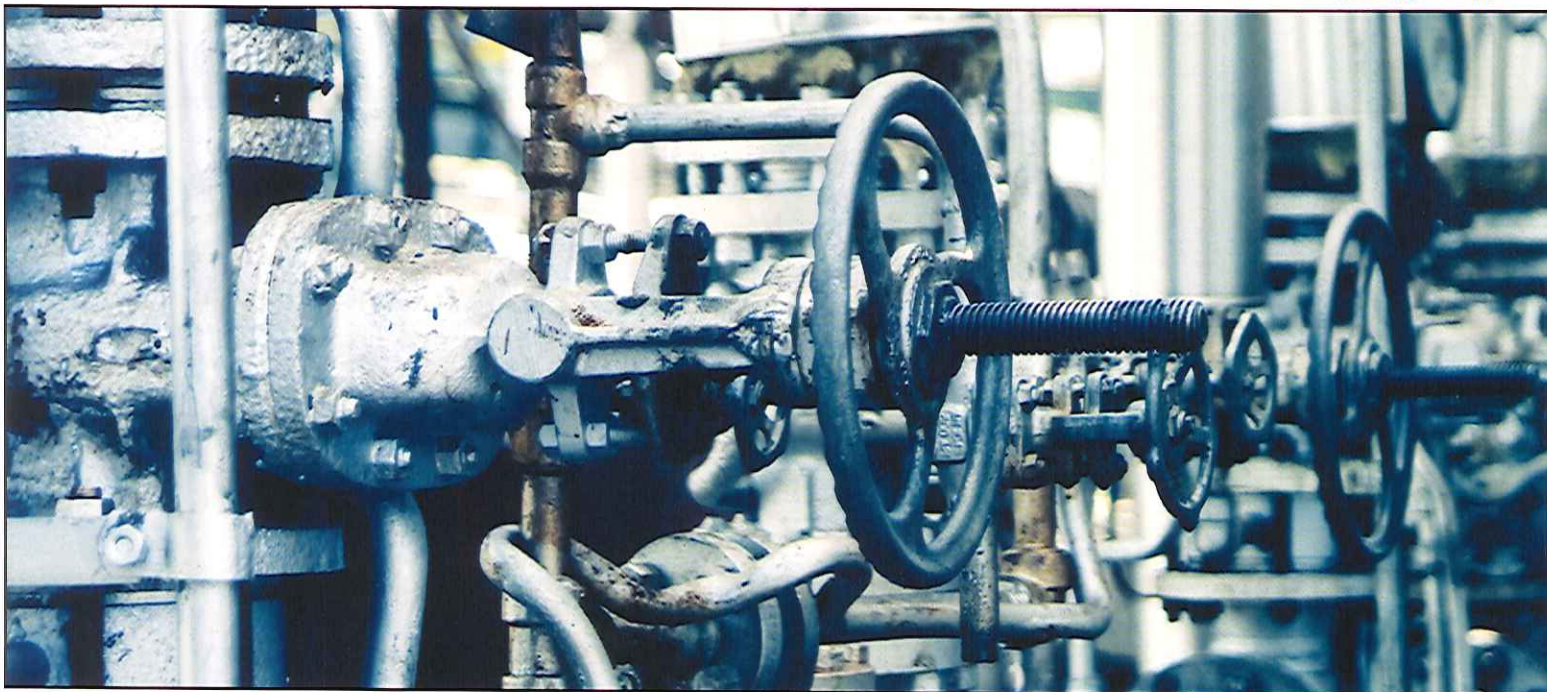
quality as the cost associated with generating steam is reduced. One customer reported that their production line speeds increased by 14% after consulting with us.

Over the past few years, WARE has been able to partner with a major paper manufacturer in the U.S. We have conducted Steam Studies on 7 of their paper mills. In addition to working extensively with select manufacturers, our Steam Study experts have traveled as far as Texas, California, and Massachusetts to assist plants in operating more efficiently and effectively.

Steam Studies are not all we have been doing with steam. We have been partnering with a company (Skinner Power Systems) based in the Northeastern region of the country to provide customers with Combined Heat and Power solutions.

Combined Heat and Power (CHP) is described as the sequential and simultaneous generation of heat and power from the same fuel source. This process often incorporates steam by utilizing a high pressure boiler with a backpressure steam turbine generator. Using steam in this process is highly beneficial; steam is a great medium for carrying and transferring heat energy, while providing a motive force to

Continued:WARE is gaining ground pg 5



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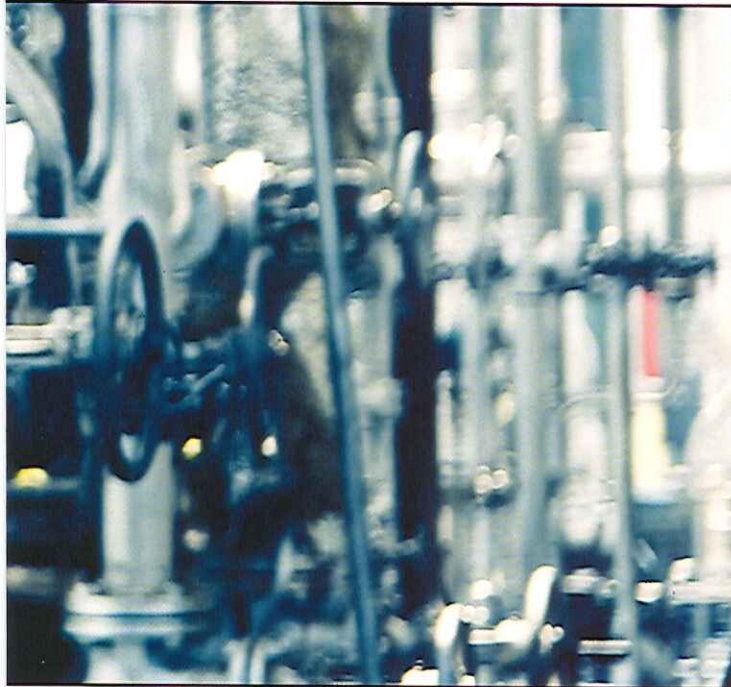
AJAX BOILER

power pumps or generators which can reduce the customers electric costs.

CHP is highly beneficial in the manufacturing community as it can increase a plant's operational efficiency while decreasing energy costs: two things that are very important to us and our customers. In addition, CHP also reduces the emission of greenhouse gases. Most CHP systems pay for themselves within the first two years of implementation.

Combined Heat and Power is common in European countries, but relatively unknown in the U.S. Through partnering with this company, as well as representing them in 40 states, we are working to make Combined Heat and Power a more common method of energy generation for our customers.

While we are still the boiler people, we are gaining ground within the steam industry as well. Our work does not stop in the boiler room. At WARE, we work with steam to increase efficiency and productivity for our customers. We are able to follow the steam footprint throughout a plant to increase its efficiency, as well as provide more efficient, steam-based methods of energy generation like CHP.



Big Announcement coming soon to better serve our customers

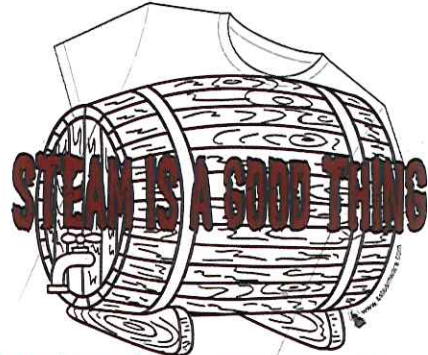
WARE BOILER UNIVERSITY

\$100.00 dollars off
when you register on-line
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2014 Classes schedule

WARE will be exhibiting at the following trade show:

Global Petroleum Show 2014
on June 10 - 12 at Stampede Park
Calgary, Canada
Booth # for WARE 5146



**BOILER MAKES STEAM - STEAM MAKES WHISKEY -
WHISKEY MAKES MY BABY A LITTLE BIT FRISKY**

All net proceeds from the sale of SteamWare T-shirts go to Kosair Charities. Where health care is provided to Children when there is no one else to turn to. Check it out on www.4steamware.com





The GRIME

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Newsletter

Equipment List

All equipment listed is for sale or lease and is subject to availability

Unit	HP/PPH	Year	Manufacturer	Fuel	Type	Pressure	Controls
779	82,500	2013	Victory Energy/Limpsfield	G/#2	Steam	350	IRI
767	75,000	2011	Victory Energy	G/#2	Steam/SH	750/750	IRI
747	75,000	2000	B&W (Low NOx)	G/#2	Steam/SH	750/750	IRI
750	70,000	1996	Nebraska (Low NOx)	G/#2	Steam/SH	750/750	IRI
752	60,000	1980	B&W	G/#2	Steam	750/750	IRI
709	60,000	1979	Zurn (Low NOx)	G/#2	Steam	500	IRI
741	60,000	1979	Zurn	G/#2	Steam	550	IRI
SB79	40,000	1986	Cleaver Brooks	Gas	Steam	260	IRI
496	800	1990	York-Shibley (Low NOx)	G/#2	Steam	200	IRI
634	800	1972	York-Shibley	G/#2	Steam	150	IRI
620	800	1975	York-Shibley	G/#2	Steam	250	IRI
SB123	600	2008	York-Shibley (Low NOx)	G/#2	Steam	150	UL/CSD1
SB139	500	2001	Cleaver Brooks		Steam	150	
SB63	500	1985	Superior	G/#2	Steam	150	IRI
SB152	400	2011	York-Shibley (Low NOx)	G/#2	Steam	150	UL/CSD1
SB138	350	1994	Cleaver Brooks		Steam	150	
SB137	250	1994	Cleaver Brooks		Steam	150	
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
SB148	200	1995	Kewanee	Gas	Steam	325	IRI
SB146	200	1995	Kewanee	Gas	Steam	325	IRI
SB170	250XID	2012	York-Shibley(Low NOx)	G/#2	Steam	150	UL/CSD1
SB194	175XID	2014	York-Shibley	G/#2	Steam	150	UL/CSD1
SB183	175XID	2012	York-Shibley	G/#2	Steam	150	UL/CSD1
SB191	150	2014	York-Shibley	G/#2	Steam	150	UL/CSD1
SB196	150	2014	York-Shibley	G/#2	Steam	150	UL/CSD1
SB193	150	2014	York-Shibley	G/#2	Steam	150	UL/CSD1
RB769	150	1998	Precision	Electric	Steam	150	UL
SB178	100XID	2011	York Shibley	G/#2	Steam	150	UL/CSD1
SB192	100XID	2014	York Shibley	G/#2	Steam	150	UL/CSD1
SB188	70	2013	York Shibley	G/#2	Steam	150	UL/CSD1
SB189	50	2013	York Shibley	G/#2	Steam	150	UL/CSD1



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WARE Buys Used Boilers

All equipment listed is for sale or lease and is subject to availability

Unit	Size	Manufacturer	Voltage	Type	Year
RC-24	30 Ton	Mc Quay	480 v	3 ph	2000
RC-21	40 Ton	Mc Quay	480 v	3 ph	1999
RC-1	60 Ton	Mc Quay	480 v	3 ph	1995
RC-2	60 Ton	Mc Quay	480 v	3 ph	1995
RC-13	60 Ton	Trane	200-230 v	3 ph	1989
RC-5	95 Ton	Mc Quay	480 v	3 ph	1995
RC-6	105 Ton	Mc Quay	480 v	3 ph	1995
RC-8	155 Ton	Mc Quay	480 v	3 ph	1995
RC-10	195 Ton	Mc Quay	480 v	3 ph	1995
RC-11	195 Ton	Mc Quay	480 v	3 ph	1995
RC-25	300 Ton	Mc Quay	480 v	3 ph	2003

New YORK SHIPLEYS AVAILABLE

Unit	HP/PPH	Year	Manufacturer	Fue	Type	Pressure	Controls
SSB23	50 hp	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB21	70 hp	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB29	100XID	2014	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB18	150	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB20	175XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB25	250XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB14	300XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB8	400XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB15	500XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB28	600XID	2012	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1
SSB30	800XID	2014	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1

WARE held its annual Partners Conference on April 11th & 12th with 30 Partners in attendance representing 27 companies. The Partners Conference was kicked off with a tour of WARE's maintenance facility, The Valve Shop and WARE's new "Super High Efficiency" Mobile Boiler Rooms.

At the annual meeting, The High Fire award was given to the partner with the highest total sales for the year. That partner was Mr. Gary Jarrell of Valley Boiler & Mechanical Roanoke, VA. The Main Flame award was given to Partners that met their budgets. Partners that received the Main Flame award are, Mr. Chris Robison of Burner Combustion Systems Crosby, TX, Mr. David Owens of L W T Greer, SC, Mr. Hollis Marshall of Matt Marshall & Company Greensboro, NC, Mr. Kyle McCain of McCain Engineering Pelham, AL, Mr. Tom Schmidt of Stoermer Anderson Cincinnati, OH, Mr. Lou Okonski of Troy Boiler Works Albany, NY and Mr. Gary Jarrell of Valley Boiler & Mechanical Roanoke, VA. The Ignition award is given to the Partner that had the best budget start of the season, this award was given to Mr. Lou Okonski, of Troy Boiler Works Albany, NY. WARE added a new award this year, Top Valves Sales, this award went to, Mr. Lou Okonski, of Troy Boiler Works Albany, NY.

The conference ended with a Bang as we all watched the great "Thunder over Louisville", known as the largest fireworks show in North America.

WARE appreciates all the hard work, time and effort of our Partners.