



Steam for Swine

As a full-service boiler company, WARE inevitably encounters a wide range of problems at various facilities across the country. Sometimes these situations have a quick and easy solution—news that is obviously well-received by customers. Unfortunately, not all cases can be so easily knocked out. Sometimes the problem is so extensive that the conversation turns from discussing a quick repair to planning a complete overhaul or a total replacement. Such was the case for one of WARE's customers, who specializes in pork production and relies upon a bulky steam load to keep their operations running six days per week.

This particular customer had some tube leaks on a large watertube boiler; while it started off as some routine repair work, it quickly became apparent that a great many tubes were affected, and it would ultimately be more cost effective to completely replace all the tubes the boiler. This is a Nebraska boiler capable of producing 75,000 pounds of steam per hour, so a full tube job is no small undertaking. To make matters worse, a large amount of refractory would also need to be re-poured, and the boiler skin would need to be completely replaced after the tubes are put in.

The facility has two other boilers (one of which mixes some of the 'stink gas' off the process with the combustion air); when put together & operating at full capacity, these two boilers can carry the plant, but running that hard for six days each week would be an awful lot of strain, and any redundancy would be lost. It was ultimately decided that WARE needed to provide a temporary boiler solution while the main boiler is being repaired.



WARE was able to mobilize a similar 75,000 pound per hour Nebraska boiler to carry the load over the next few months while the full tube replacement is taking place. The customer requested turnkey service, so WARE shipped the boiler to site, arranged for temporary electrical service to the boiler, and had it piped in & insulated. State

boiler inspection was then arranged, and a technician started & tuned the boiler, then trained the local operators on WARE's operation and daily maintenance procedures. As with most turnkey projects, there were some challenges to overcome on site. The location where the boiler had to be placed was beneath an air intake on the exterior of a building, so an additional stack had to be provided with the boiler to get its emissions' exhaust point above that intake—otherwise, the exhaust could potentially be sucked into the building, where people are working.

The rental boiler is currently holding a balanced load with the customer's boilers, but stands ready to pick up the full plant load if one of the other boilers should fail. Having that redundancy in place will ensure that the plant can continue to run through the winter months and not lose any production. When you need a full-service solution for your plant, WARE has proven its capability to handle the challenge. If you need service, repair, rentals, replacement equipment, or any combination thereof, call WARE and protect your facility from unnecessary downtime.

How a Pre-Heated Feed Water System Works

We get it.

Boilers sometimes seem too complex to fully understand, so you don't try.

You shrug your shoulders and say "Oh well. I don't need to know how it works, as long as it doesn't break."

And then the inevitable happens—something breaks.

"Pre-heated feed water system... what's that?"

Despite all your best intentions, your boiler fails for whatever reason, and you don't understand why.

But it doesn't have to be that way. Boilers aren't as complicated as you think, and we want to prove that. So today, we'll be explaining how a pre-heated feed water system works.

"Pre-heated feed water system... what's that?"

Glad you asked!

If you've got a boiler that doesn't have a deaerator installed, you probably have a typical feed water tank with a pump. As you can guess, this feeds water into your boiler, but it has other important jobs as well.

As your boiler operates, it returns water to the feed water tank. If a lot of water is coming back from the system, your feed water tank probably maintains a pretty high



temperature (somewhere around 160 – 170 degrees or more) all on its own.

But that's not always the case.

If your system is just starting up, or if there isn't much condensate returning to the feed water tank, a pre-heated feed water system may be necessary.

Here's why:

If you feed cold water straight into your boiler, it will shock the boiler. The greater the difference between the feed water temperature and the temperature of the boiler, the more thermal stress that occurs. This causes the metal at the water inlet to become brittle, eventually leading to a crack, which (as you can guess) is not good.

With a pre-heated feed water system, steam is injected into the pre-heat tank to maintain the water's temperature at an acceptable level. This is called sparging.

There are three main components to a pre-heated feed water system:

1. Temperature control (to maintain appropriate temperature)

2. Integrated valving (integrated with temperature control)

3. Source (steam supply for heat)

To maintain the appropriate temperature of the water in the feed water tank (between 180 – 185 degrees on a vented pre-heated tank) you'll need to adjust the temperature valve.

Warning: you never want boiling water in the feed water tank—trust us on this one. If the water is too hot, it can't be pumped into the system.

Adjusting the temperature control valve on a simple pre-heated feed water system is easy. All you need to do is screw the setpoint adjustment to raise the temperature set point. When you make these adjustments, make them in small increments to see their effect.

Pre-heated feed water systems are great for any system that starts and stops regularly, because they quickly bring up the temperature of the water, enabling it to feed into the boiler.

The best part about pre-heated feed water systems? They're simple! Congratulate yourself on taking the time to educate yourself about your boiler. Easier than you thought, right?



Watch a video on -
How a Pre-Heated Feed System Works



How to Avoid Shocking Your Boiler Refractory

And How to Fix it if it Gets Shocked

Your boiler's refractory is used to contain and spread heat within the boiler.

Here's the good news: if your refractory is working properly, you won't think much about it.

Here's the bad news: if your refractory fails, you're looking at downtime and repair costs.

"Downtime? Repairs? No thanks!"

We hear you, and we want to help you avoid that.

Consider this situation:

It's winter, and it's cold. Your boiler is located right next to the garage door where you receive deliveries, and the delivery of chemical drums has just arrived. So, you open the door to bring them in.

As you open the door, a rush of cold air flows in. At the same time, your boiler decides now is a good time to cycle on, and it pulls in a bunch of cold air.

And boom. Just like that, you've shocked your refractory.

It's a small crack, so you decide to patch it.

"No big deal," you think.

And it isn't...until a few weeks later. The metal door of your boiler is burned

because the patch wasn't done correctly. The refractory wasn't working properly, so heat was moving down the back side of the refractory and exiting on the corner of the door.

Since you weren't expecting to need a new door, you don't have one available. You get online to check and realize you won't be able to get one shipped in for at least 3 more days.

Now you're looking at 3 unexpected days of downtime. Sounds like a nightmare, right?

This scenario highlights the importance of 2 things, both of which we'll cover in this article.

1. Doing all you can to avoid shocking your refractory
2. Repairing your refractory correctly if it does get shocked

As evidenced by this scenario, failure to do these things could result in a costly repair and/or extended downtime.

We recommend you do these things to avoid shocking your boiler refractory:

1. Pre-heat outside combustion air

Your boiler pulls in air to aid combustion. Implementing a pre-heating mechanism will ensure the air used for combustion reaches a temperature that won't shock your boiler.

2. Properly warm up and shut down your boiler

When you start your boiler, allow it to warm up before you put it online. Additionally, give it enough cooldown time at shutdown to avoid the shock of an abrupt stop.

3. Minimize boiler cycling

Boiler cycling is when your boiler turns on and off. Make sure your boiler is properly tuned and set up to minimize cycling.

If you accidentally shock your refractory and need to repair it, here's what we recommend:

1. Call a professional.

This isn't a sales pitch, we promise. The fact is, spending a little money to hire a professional to fix your refractory may cost more in the short-term, but it will save you from the long-term hassle of unexpected downtime or a more expensive repair.

2. Repair it yourself properly. Here's how:

- a. "V"-out the cracks by cleaning out loose materials.
- b. Using a spray bottle, dampen Ram 90 and the area to be patched.
- c. Work Ram 90 into the cracks and smooth it out.

If you repair the patch yourself, you should know these two things:

1. DIY-patching should only be done if the hole is smaller than your fist. We strongly recommended professional patching on holes bigger than your fist.
2. There's about a 50% chance that, once you start the boiler again, the patch may fail—especially if your mixture is damp.

As you can see, there are measures to repair your refractory if it gets shocked, but we think it's better to avoid the whole issue in the first place. Don't you?



Watch a video on -
Shocking Steam
Boiler Refractory



BOILING POINT



How a Watertube Works



Combustion Management
21st Century



Explaining the Slow Low
Water Cutoff Test

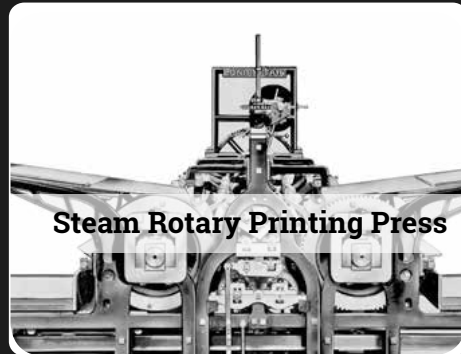
STEAM CULTURE



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Amelin

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WARE
new and used
List

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

Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
779	82,500	2013	Victory Energy Limpsfield	(Low NOx) G/#2	Steam	350	IRI
796	82,500	2016	Victory Energy Faber	(Low NOx) G/#2	Steam	350	IRI
797	82,500	2016	Victory Energy Faber	(Low NOx) G/#2	Steam	350	IRI
767	75,000	2011	Victory Energy	(Low NOx) G/#2	Steam/SH	750/750	IRI
747	75,000	2000	B&W	(Low NOx) G/#2	Steam/SH	750/750	IRI
791	75,000	2016	Victory Energy	(Low NOx) G/#2	Steam/SH	750/750	IRI
750	70,000	1996	Nebraska	(Low NOx) G/#2	Steam/SH	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
795	40,000	1986	Cleaver Brooks	Gas	Steam	260	IRI
496	800	1990	York-Shipley	(Low NOx) G/#2	Steam	200	IRI
634	800	1972	York-Shipley	G/#2	Steam	150	IRI
SSB30	800XID	2014	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1
620	800	1975	York-Shipley	G/#2	Steam	250	IRI
SSB28	600XID	2012	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1
SSB15	500XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB139	500	2001	Cleaver Brooks		Steam	150	
SB226	400	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD1
SB138	350	1994	Cleaver Brooks		Steam	150	
SSB39	300XID	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB40	250	2017	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
SB216	250XID	2015	York-Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB148	200	1995	Kewanee	Gas	Steam	325	IRI
SB146	200	1995	Kewanee	Gas	Steam	325	IRI
SB213	175XID	2014	York-Shipley	G/#2	Steam	150	UL/CSD-1
SB220	175XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD-1
SB240	175XID	2017	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB20	175XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SWVB1	1200	2017	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1
SWVB2	1500	2017	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1

One hour quote on-line at www.wareinc.com or call 800-228-8861

continued
WARE
 New and used
List

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

Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
SSB38	150	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB235	150	2016	Victory Energy	G/#2	Steam	150	UL/CSD1
SB236	150	2016	Victory Energy	G/#2	Steam	150	UL/CSD1
769	150	1998	Precision	Electric	Steam	150	UL
SB-232	100	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-228	100	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB41	100	2017	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-237	70	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-238	70	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB35	70	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-234	50	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-227	50	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB33	50	2015	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
Unit	Size	Manf.	Volt.	Type	Year		
RC-24	30 ton	Mc Quay	480v	3 ph	2000		
RC-26	40 Ton	Mc Quay	480 v	3 ph	1999		
RC-1	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-10	195 Ton	Mc Quay	480 v	3 ph	1995		
RC-11	195 Ton	Mc Quay	480 v	3 ph	1995		

Chillers

One hour quote on-line at www.wareinc.com or call 800-228-8861

Events

WARE will be exhibiting

AHR EXPO - January 22 - 24, 2018

BOOTHS 7123 / WARE

8133 / WARE Boiler University



2018 BOILER UNIVERSITY NEW CLASS SCHEDULE



Boiler 101 is a two-day introduction to the boiler room, covering all of the important aspects from water treatment, to boiler operations, to condensate systems. This seminar style, media-rich class offers a great first look at boilers for beginners, a great review for experienced operators, maintenance employees, plant engineers, contractors, production employees, service technicians, or a great starting point for anyone in a boiler room, and will provide a roadmap to keep your boiler room on the right track.

Boiler 201 is a three-day program building on the 101 foundation, but adding the full experience of our Louisville Boiler Lab, providing hands-on opportunities on many subjects with our four fully-operational lab boilers. Beginners will get the full perspective of an operating system, and even seasoned operators and contractors will gain valuable insight from displays, such as our fully glass piped steam and condensate system demonstrator.

101 Classes

Two Days, \$1,200.00

February	06-07, 2018	Knoxville, TN
March	13-14, 2018	WKU, KY
April	17-18, 2018	Chattanooga, TN
May	15-16, 2018	Louisville, KY
July	10-11, 2018	Louisville, KY
August	14-15, 2018	Chattanooga, TN
September	11-12, 2018	Augusta, GA
September	25-26, 2018	Louisville, KY
October	16-17, 2018	Nashville, TN

201 Classes

Three Days, \$1,800.00

January	09-11, 2018	Louisville, KY
April	24-26, 2018	Louisville, KY
August	21-23, 2018	Louisville, KY
November	13-15, 2018	Louisville, KY

2018 Class Information and Registration Available at www.wareboileru.com



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.

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