



# TAKE YOU TO SCHOOL... BOILER SCHOOL

## Three Steps to Get the Most Out of What You Have

Do you know the practical steps to take to get the most out of your current boiler? Do you know how to optimize your boiler's efficiencies? Can you spot problem areas on your boiler before they harm your system? The answers to these questions are uncovered at our three day instructional course, Boiler University.

How do you get the most out of what you have right now as it relates to your boiler operation? There are three main areas which answer that question. Boiler University takes an in-depth look at each of the three areas, so you can begin optimizing and prolonging the life of your boiler.

### 1) Start with what you have! - Optimize the operating efficiency of your existing equipment

**Water Chemistry:** Your heat transfer surfaces must be free of scale. To reduce scale, water chemistry must be a top priority.

**Combustion:** Combustion tuning is highly recommended twice per year, generally taking place af-

ter major seasonal changes in spring and fall. Soot that gathers on fireside surfaces must be routinely cleaned to maintain optimum heat transfer.

**Pressure Control Synergy:** Boiler firing rate and operating limit controls must be properly coordinated to prevent frequent cycling of the boiler. Excess boiler cycling can result in tens of thousands of dollars of energy waste.

### 2) Do the right things, day in and day out! - Daily, Weekly, Monthly and Annual Maintenance

#### Daily Maintenance

- Chemical hardness testing
- Continuous blowdown adjustment
- Bottom blowdown
- Level control limit checks
- Boiler room log maintenance

#### Weekly Maintenance

- Rotate feed water pumps
- Visually inspect steam system
- Review chemical and boiler logs to spot inconsistencies

#### Monthly Maintenance

- Slow or evaporation low water cutoff testing

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# Boiler Blowdown - How Doing the Simple Things Can Optimize Your Boiler Operation

We have heard it many times, “routine maintenance on your boiler is critically important.” If it is so important, why is it one of the biggest contributors to why boilers fail? It is not overly complex, however it requires a commitment to examine and log important factors about your boiler. Something you can do daily to help maintain a healthy operation is performing boiler blowdown.

Boiler blowdown is water that is taken from the boiler at points where concentrations of impurities in the water are high. These impurities, if left unchecked, will significantly reduce the operation of your boiler and can lead to boiler failure.

## Why boiler blowdown?

1. Removal of accumulated solids that settle in the mud drum
2. Removal of dissolved solids

That may sound overly simplified, however, addressing these factors are critical to the routine maintenance of your boiler on a daily basis. Not only will it help to ensure your boiler is running at optimized efficiency, it is a way to ensure certain safety checks are met.

## Types of Boiler Blowdown

There are two main types of boiler blow down, surface blow down and bottom blowdown.

**Bottom Blowdown:** As its name suggests, this function happens at the bottom of the boiler commonly known as the mud drum. In bottom blowdown, an operator is manually removing the particulate that has settled in the mud drum. It is critical that this is completed to remove the sludge before it builds up in the water that circulates past the heat transfer surfaces.

**Surface Blowdown:** Happens near the surface at the location where the concentration of dissolved solids is highest. Surface blowdown, also known as continuous blowdown, removes the dissolved solids from the steam drum. These dissolved solids would rapidly lead to scaling if they were not removed from the system.

## Blowdown Frequency

How often you should perform blowdown is largely contingent on the quality of your feed water.

**Bottom Blowdown:** Should be completed at least once per day or once per shift.

**Surface Blowdown:** Should be automated throughout operating hours depending on water quality.

## Blowdown Procedure

**Bottom Blowdown:** ASME has a preferred order on how to perform bottom blowdown. This is a manual operation completed by a boiler technician. There are typically two valves associated with bottom blowdown – a slow opening valve and a quick opening valve.

- The quick opening valve is closest to the boiler and is opened first
- The slow opening valve is then opened for a period of time that should be determined by your water management consultant. It is important to monitor the gauge glass during this process to maintain a safe water level.
- Close the slow opening valve first
- Close the fast opening valve last and re-open the slow closing valve to allow the trapped water to drain out.
- Re-close the slow closing valve

**Surface Blowdown:** As this is typically an automated process that happens at rates determined by your water management consultant, the procedure does not require a great deal of operator interaction. However, it is important to routinely check the safeties associated with the continuous blowdown equipment.

Boiler blowdown is a simple way to extend the life of your boiler. **There are also ways to recover surface blowdown to save energy and money for your plant operation.** To learn more about how you can benefit from boiler blowdown, call Ware to speak with our industry leading boiler experts (800) 228-8861.







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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	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
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-Shipley (Low NOx)	G/#2	Steam	200	IRI
634	800	1972	York-Shipley	G/#2	Steam	150	IRI
620	800	1975	York-Shipley	G/#2	Steam	250	IRI
SB139	500	2001	Cleaver Brooks		Steam	150	
SB200	400	2014	York-Shipley (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
SB216	250XID	2015	York-Shipley(Low NOx)	G/#2	Steam	150	UL/CSD1
SB213	175XID	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
SB220	175XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB210	175XID	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
SB217	150	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB214	150	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB209	150	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
RB769	150	1998	Precision	Electric	Steam	150	UL
SB218	100XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB214	100XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB221	100XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB206	70	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
SB207	50	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
SB211	50	2014	York-Shipley	G/#2	Steam	150	UL/CSD1

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Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
SSB33	50 hp	2015	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
SSB31	100XID	2014	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB32	150	2015	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
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

Unit	Size	Manf.	Volt.	Type	Year
RC-24	30 ton	Mc Quay	480v	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

Chillers



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- Testflame scanner and all operating limits and interlocks
- Comprehensive combustion analysis

### Annual Maintenance

- Open and inspect steam boilers operating over 15 psi
- Inspection on hot water or low pressure steam boilers is done on alternating years
- Fire boilers on backup fuels prior to heating season
- Bubble leak test gas train piping and valves
- Check chemicals on hot water heating systems

3) **Be on the lookout!** – Have a detailed knowledge of the common issues that face all boiler operations

**Thermal Stress:** Rapid cycling and severe ser-

vice conditions can result in tube and pressure vessel failure

**Poor Maintenance:** Lack of daily testing and routine maintenance

**Mechanical Malfunctions:** Every switch will eventually fail, routine testing and replacement when it's required will keep your system running flawlessly

**Chemistry:** Poor water quality will result in boiler failure faster than any other cause

This is in no way a comprehensive list of what is covered at Boiler University, however at Boiler U, students take a detailed look at how to improve their boiler operations. With hands on demonstration, boiler technicians will be equipped to optimize their boiler's performance. For more information about how to get the most out of what you have, contact Ware today or visit [www.boilerroom.com](http://www.boilerroom.com).



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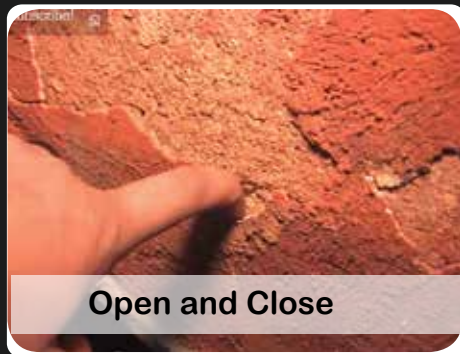
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## WARE'S 2015 ANNUAL PARTNERS CONFERENCE

WARE held its annual Partners Conference on April 28th and 29th. There were a total of 30 Partners in attendance representing 19 companies. The following is the list of awards and who received them:



**High Fire Award** (highest total sales for the year) Mr. Gary Jarrell of Valley Boiler & Mechanical.

**Main Flame Award** (Companies who met their budget)

Mr. Chris Robinson of Burner Combustion Systems

Mr. James Hite of Combustion Service & Equipment Company

Mr. John Kelly of Innovative Boiler Systems

Mr. Kyle McCain of McCain Engineering

Mr. Ray Vonck of Process Engineering Company

Mr. Tom Schmidt of Stoermer-Anderson

Mr. Lou Okonski of Troy Boiler Works

Mr. Gary Jarrell of Valley Boiler & Mechanical

**The Ignition Award** (Company with the best start at the first of the year)

Mr. Kyle McCain of McCain Engineering

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



Contact your local representative  
(800-228-8861)  
for Steam Studies



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.

[4STEAMWARE.COM](http://4STEAMWARE.COM)

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