Discover WARE

The Grime

October and November 2016 Newsletter

A Victory for the Dryback Firetube Boiler

by Alex Taylor, National Account Rep

In August, WARE received the very first of Victory Energy's new dryback firetube boilers. Traditionally, Victory's Frontier® series has been characterized by its wetback firetube boiler model. However, with the success of this model's production and demand for a dryback option, Victory Energy announced earlier this year that they would be expanding the product line to satisfy market requests. Within just a few short months, Victory has proven their ability to take the idea from conception to reality, delivering on their promise. WARE has a history of successes and a good relationship with Victory Energy's watertube boilers, so with a combination of proven manufacturing capabilities, cost-effectiveness, and the availability of a reliable center-fire design, it makes sense for WARE to utilize this new design in its offerings.

So what is so great about it? In case you missed the June/July edition of The Grime, the design of a dryback boiler allows its length to be shorter, which comes in handy when you install it in the back of a 47' semi trailer where space is at a premium. The trailer was designed and custom-built for one of WARE's clients, and it included a deaerator, blowdown separator, and a control panel, making it a complete mobile boiler room. Another advantage of using a dryback boiler is that the rear door can be unbolted and the tubes can be accessed; if any tubes need to be replaced in the future, they can just pull them out the rear doors of the trailer, and any damaged refractory in the rear door of the boiler can be easily repaired as well. Also, whereas most wetback boilers require confined space entry permits to get into the rear of the boiler, drybacks do not, so you can save yourself some time and hassle there.

As for the technical details on the boiler, this particular unit was a 650 hp, 200 psi design pressure, 2-pass package boiler, complete with a Power Flame C-Max burner that operates on natural gas or #2 diesel fuel and is capable of producing 22,425 lbs. of steam per hour, per the client's request. The new Victory Energy dryback firetubes that WARE will be keeping in stock are efficient 3-pass systems, available with either standard or low NOx burners, and they can be ordered in capacities from 25 to 1,000 hp. Whether you need just a boiler, a mobile trailer, or even a boiler room housed in a shipping container, WARE has demonstrated years of experience and competence in providing these boiler solutions. The new products that Victory Energy now provides will only help to improve those capabilities and solve the problems that customers like you trust WARE to tackle.

YouTube Watch WAREboilers channel

Watch a video on-
Rental Boiler Contingency plan

Testing and Maintaining a Healthy Deaerator (DA)

Deaerators are pressure vessels. Their main purpose is to produce preheated boiler feedwater and to remove O2 and CO2 gases from the boiler to the greatest extent possible. If the system is not operating as specified, major damages to your boiler system can occur due to un-removed dissolved O2 and CO2 present in the feedwater.

DA's are the unsung heroes in your steam system. Often times they go unnoticed and get very little attention until the boiler malfunctions, thus affecting steam generation for the entire plant. Just as it is best practice to routinely check and maintain your boiler, it is also important to undergo routine testing and inspection.

Because your DA has two main functions - preheating feedwater and removing corrosive gases it is critical to test that these two goals are being met by your DA system.

Important Tests for Your DA:

1) Testing Feedwater Temperature - You first have to test that the temperature of the water in the feedwater storage section corresponds exactly to the temperature indicated for the steam pressure supplied to the deaerator section. If the temperatures are different, you can start by addressing one of the following:

- •Check Spray Valves - Just 1 malfunctioning spray valve can result in a loss of several degrees of water temperature
- •Check Distribution Trays - They could be plugged or damaged, thus preventing proper mixing of the water and steam

2) Testing Levels of Corrosive Gases – When functioning as specified, your DA liberates the vast majority of O2 in the feedwater – but not all of it. A DA built to today's industry codes will typically provide water with a dissolved O2 content between the range of 6-10 parts per billion. To reduce that number to nearly zero parts per billion, an oxygen scavenging chemical must be added. Dissolved oxygen testing of the feedwater supplied by the deaerator can be accomplished by the colormetric (color compactor) indigo carmine method or by installing a continuous Oxygen monitoring system. If an oxygen scavenger is not present, the dissolved oxygen should be no higher than 10 ppb. With a scavenger present the dissolved oxygen should be zero. If these parameters can't be met, start by checking:

- •Steam supply
- •Feedwater temperature
- •Spray valves
- •Distribution trays
- •Atmospheric vent

Routine Checks for your DA System:

This is not an exhaustive list, but it provides a good starting point for developing a maintenance checklist for your DA system.

- •Check integrity and functionality of pressure and temperature gauges and/or sensors
- •Visually examine all vessel welds for cracks and leaks
  - -Nondestructive tests of all vessel welds on a five-year basis
- •Once per year, check for visual signs of debris and corrosion
- •Semi-annual testing of unit performance/dissolved O2 without chemical feed
- •Evaluate use of sulfites – large swings in sulfate levels can be in indication of spray valve or tray malfunction
- •Check all valves and manways
- •Check gauge glass which is visible by operators to monitor and confirm water level
- •Calibrate all instruments on an annual basis

For more information, or to have your DA inspected by a seasoned boiler technician, contact a WARE steam specialist today.

You Tube Watch
WAREboilers channel

Watch a video on-
The difference between dearator and a condensate tank

Thermal Shock and How to Avoid It

If you have ever jumped into a cold pool on a warm summer day, you probably have an adept understanding of thermal shock.

Thermal shock, as it relates to steam boilers, happens as a result of the resistance of the boiler structure to movement caused by thermal expansions and contractions within the boiler. These stresses occur every firing cycle in varying degrees.

Thermal shock can lead to boiler failures such as leaks at the tube-to-tubesheet joints, cracked tubesheet ligaments, or broken stays. Failures of this type are costly in downtime and repairs.

What Causes Thermal Shock?

1. Short cycling – this most commonly happens when your boiler is oversized for the application
2. Poorly tuned burner controls
3. Low temperature return water to the boiler – if the temperature of the return water is low, it creates a cyclic cooling and reheating of the shell and tube surfaces. In ideal conditions your boiler will maintain a constant temperature and steam output

It is required for the boiler manufacturers to set guidelines for the system-and-controls designers to use, in order to minimize these effects.

- These guidelines include:
- A minimum water return temperature to the boiler
- A minimum water flow rate through the boiler
- Recommendations as to how to set burner controls to maximize the boiler shell temperature for a given operating pressure, and minimize the number of operating cycles and the burner firing rate, for a given load condition

How Do You Reduce Thermal Shock?

When concerning thermal shock, you should address two major criteria - reducing the magnitude of the stresses induced (reducing furnace-metal temperature to shell-metal temperature) and reducing the number of stress cycles (burner firing cycles). This can be accomplished through:

Burner Tuning - Correctly setting the burner combustion and maintaing optimal feed water temperature.

Boiler Sizing - It is critical to have the appropriate boiler size for your application in conjunction with a proper turndown rate. You should also pay particular attention to seasonal changes as it relates to the sizing of your steam system. Too large a system and your boiler will be subjected to unnecessary short cycling, inversely, if your boiler is too small you will not have adequate steam for your given application.

Failures caused by thermal shock are fatigue failures caused by thermal stress cycling. In almost every case there is not an indication of boiler design or manufacturing deficiencies, but more commonly issues arise due to the manner in which the boiler has been sized, controlled or operated.

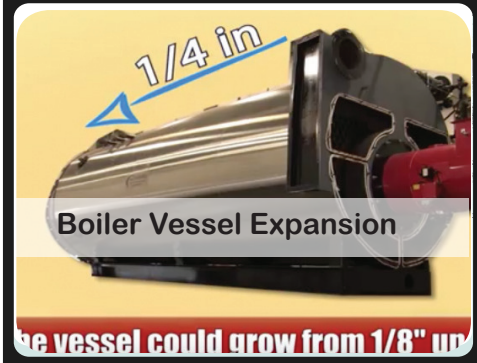
WARE has a team of experienced technicians who have sized and tuned boilers for a wide variety of applications. Our decades of field experience give us the confidence to quickly troubleshoot your unique steam application. For assistance in boiler sizing or burner controls tuning – call us today!

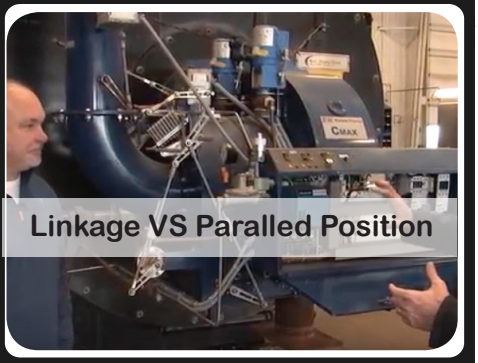
You Tube Watch
WAREboilers channel

Watch a video on-
Water level control sensors

Informative WARE videos

BOILING POINT





STEAM CULTURE

PRODUCT VIDEOS

HelioJet industrial cleaning technology - water jet

Heat Sponge

CASE STUDIES

Heaven Hill -78,000PPH install

Amelin

EKU - 48,000 Coal Boiler Retube

SUBSCRIBE to WARE youtube channel

youtube.com/user/wareboilers

For more Boiling Point videos: youtube.com/user/wareboilers

NEW VIDEOS UPLOADED ALL THE TIME.

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	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
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
SB137	250	1994	Cleaver Brooks		Steam	150	
SSB36	250	2016	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/CSD1
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/CSD1
SB220	175XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD1
SB210	175XID	2014	York-Shipley	G/#2	Steam	150	UL/CSD1
SSB20	175XID	2012	York Shipley	(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

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

WeRentBoilers.com

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
SB-232	100	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-231	100	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-228	100	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB37	100	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-230	70	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-229	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

Chillers

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-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		

WARE BOILER UNIVERSITY

Next Available 2016 Classes

Chattanooga, TN
November 8 - 10

For more details visit WAREBOILERU.COM

FREE SHIPPING

STEAMWARE T-SHIRTS

STEAM LIFE

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

THE VALVE SHOP℠

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

GET SOCIAL WITH US

Limpsfiled presented WARE with their Top Tech Center Award for 2015/2016 at the annual sales meeting in Charleston, SC.

Left to right: Gerald Blain - WARE's Regional Manager, Keith Knowles - Limpsfield's Managing Director, Ritchie Ware - WARE's VP Sales and Marketing, Mike Taylor -WARE's Technical & Safety Director

Discover WARE Since1952
4005 Produce Road
Louisville, KY 40218

WARE
AVAILABLE 24/7
GET SOCIAL WITH US

Member of ABMA
American Boiler Manufacturers Association