

# WARE

ALL WAYS STEAM



# THE GRIME

Spring 2020 Newsletter



By Mike Taylor

Ohio has an interesting law about boilers.

It was enacted in 1911, in response to an accident. Basically, the law requires that...

If a boiler's heating surface is over 358 square feet, you need a full-time, licensed operator 24/7.

But boilermakers and Ohio-based facilities have adapted to this law.

Boilermakers can build a boiler with up to 225 horsepower using only 358 square feet of heating surface (which means they don't need a 24/7 operator). And that's unique, because...

Standard boilers have 5 square feet of heating surface per unit of horsepower.

That means that a standard boiler with 225 horsepower would have around 1,125 square feet of heating surface.

But an Ohio Special gets that horsepower with

only 358 square feet of heating surface.

So how do they do it?

It's actually pretty simple. They take a 70 horsepower boiler shell (which is ~358 square feet) and put a bigger burner on it.

That's it!

But there is a catch...

You have to pay a lot of attention to maintenance. Because you're pushing more fire through it (relative to size) than a standard boiler.

So instead of using one large boiler to get the horsepower they need...

Ohio-based facilities use multiple Ohio Specials to get it.

Interesting, isn't it?

# How to Repair Your Boiler Refractory After it Gets Shocked (And When to Call a Professional)



**Y**ou're in Idaho in winter. It's cold. Your boiler is next to the garage door where the chemical drums are delivered.

The delivery man gets there, so you open the garage door. He brings in the drums.

While the door is open, the boiler decides to cycle. It shuts off and goes through post-purge... or it comes on and goes through pre-purge...

That detail isn't important.

Because while the boiler cycled, it sucked in the 8-degree Idaho winter air...

And shocked the refractory, putting a crack in it and causing severe damage.

This is just one way you can shock the refractory without turning the boiler on or off.

And shocking a boiler can severely damage it, so what's the solution?

Planning.

Find a different way to get the drums into the facility. Or wait a few days until the weather warms up a little, then bring the drum in.

But we've been in this business long enough to know that accidents happen.

So if you shock your refractory and put a crack in it, here's a safe rule-of-thumb:

If the crack/hole is bigger than your fist, call a professional. Because it's very hard to get right.

But if it's smaller than that and you want to repair it yourself, here's how to do it:

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

\*Note: Any cracks 1/8 of an inch or less are heat cracks and do not need to be patched.

But beware:

If you patch a door incorrectly and the boiler runs for a period of time...

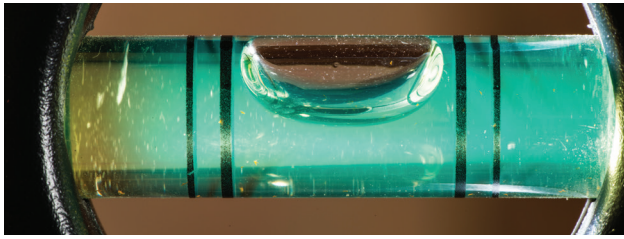
The heat can follow through the back side of the refractory and exit at the corner of the door, burning it.

Once you fully burn the metal on a door -- it will need to be replaced. And that's a challenge, because doors can take days, even weeks to arrive at your facility.

[Continued on page 7](#)



Shocking Steam Boiler  
Refractory - Boiling Point



# LEVEL WITH ME

By Alex Taylor

## The Importance of Keeping Boilers (Especially Temporary Units) Completely Level

At the most basic level, your boiler is just a big tank of water with heat blasting through it.

That heat is transferred using tubes that get very hot. Because of this, those tubes should stay submerged in water at all times. Because when a boiler's tubes are not submerged, bad things can happen.

The tubes could overheat and melt, or worse...

Water could get cycled into the boiler while the tubes are red-hot...

The water would flash into steam faster than the safety release valve could handle...

And it would cause a major explosion.

Because of these serious risks, your boiler water level should remain completely level at all times.

Boilers do have low water cut-offs that can tell when the water is too low. But these safety measures aren't perfect.

Consider this example:

One end of your boiler is lower than the other. The low water cut-off is the "deep end" of the boiler. So it thinks everything is okay...

But on the other end, you have red-hot, exposed tubes.

At best, they could melt. And at worst, they could cause a major explosion.

And this can happen whether you have a float-type cut-off or a probe cut-off.

Temporary units are more likely to be out of level than permanent units because these facilities are in a hurry to get a boiler up-and-running. So they might not fully assess the area where they're placing the boiler.

And even if the area seems level and stable at first...

The extreme heat and weight of the boiler could cause problems once it's filled with water and running.

If the boiler is on earth (dirt, etc.) -- the extreme weight of the boiler could cause the ground to sink or cave in.

And if the boiler is on asphalt -- the heat from the sun can soften the asphalt, causing it to sink.

Not only are these two situations problematic from a safety standpoint...

The boiler shifting significantly can also pull apart the piping used to keep the boiler running and delivering steam to the plant.

In both of these situations, the ground starts out level. But it becomes uneven once the boiler is up-and-running.

So what's the solution?

Continued on page 7

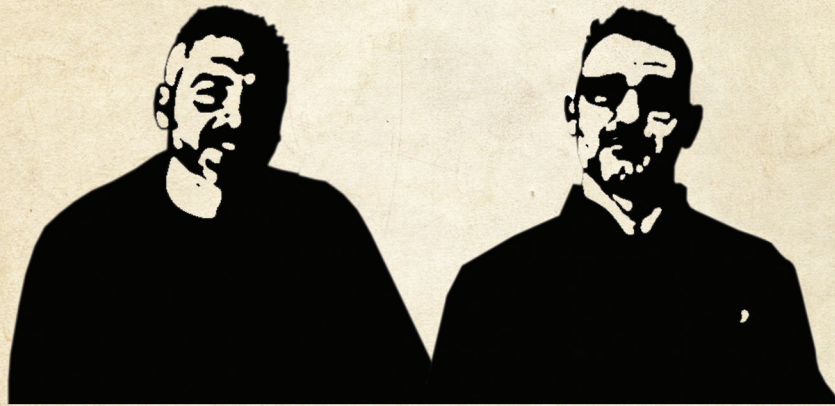


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# 52

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## 101CLASS - \$1,200.00

Is a two-day introduction to the boiler room, covering all of the important aspects from water treatment and boiler operations, to condensate systems. This seminar style, media-rich class offers a great first look at boilers for beginners, and a great review for experienced operators.

### 101 CLASS 2019 - 2020

March 17-18, 2020 - Bowling Green, KY  
April 7-8, 2020 - Chattanooga, TN  
May 12-13, 2020 - Louisville, KY  
July 28-29, 2020 - Ashland, KY

### 201 CLASS 2019 - 2020

March 10-12, 2020 - Louisville, KY  
April 21-23, 2020 - Louisville, KY

**For Other Classes Offered**  
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for details

## 201CLASS - \$1,800.00

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.

**For Other Classes Offered**  
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for details

### Classes are four hours long

**BOILER 202** - Daily Boiler Operations  
**BOILER 203** - 4 Hour Steam System Basics  
**BOILER 204** - Safety and Limit Checks  
**BOILER 205** - Energy Efficiency Options

### Classes are three days long

**BOILER 301** - Boiler Open/Close  
**BOILER 302** - Principles of Combustion  
**BOILER 303** - Hands on Flame Safeguard and Boiler Control Wiring  
**BOILER 304** - Feedwater and Level Control

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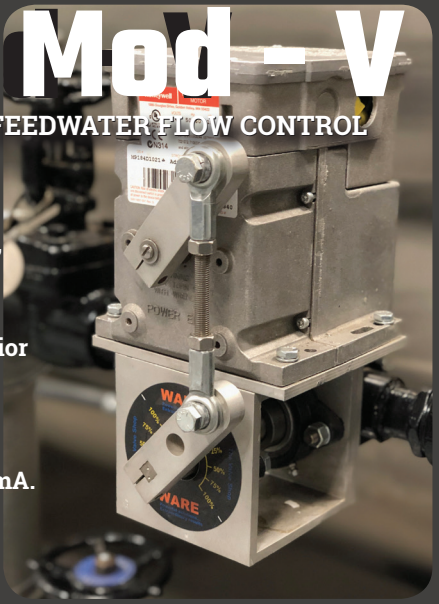
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 WAREboilers channel

and a **WHOLE LOT MORE**



# 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
SSB49	800XID	2019	Victory Energy	(Low NOx) G#2	Steam	250	UL/CSD-1
620	800	1975	York-Shipley	G/#2	Steam	250	IRI
SSB46	600XID	2019	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1
SB139	500	2001	Cleaver Brooks		Steam	150	
SB243	400	2018	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
SSB50	250	2019	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
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

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## NEW AND USED LIST continued

**ALL EQUIPMENT LISTED IS FOR SALE OR LEASE AND SUBJECT TO AVAILABILITY**

Unit	HP/PPH	Year	Manf.	Fuel	Type	PSI	Ctrl.
SB-248	175XID	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-249	175XID	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-240	175XID	2017	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-48	175XID	2019	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SWVB1	1200	2017	Victory Energy	(Low NOx) G/#2	Steam	250	UL/CSD-1
SB-251	250	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-47	150	2019	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-252	150	2019	Victory Energy	G/#2	Steam	150	UL/CSD1
SB-250	150	2019	Victory Energy	G/#2	Steam	150	UL/CSD1
769	150	1998	Precision	Electric	Steam	150	UL
SB-246	100	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-239	100	2017	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-41	100	2017	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-241	100	2008	York-Shipley	Gas	Steam	150	UL
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
SSB-35	70	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-247	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-234	50	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-244	100	2018	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-45	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1

EVENTS  
EVENTS  
EVENTS

**WARE will be exhibiting at:**

NFMT - Mar. 17 - 19, 2020 - Baltimore, MD  
 AAE - Apr. 21 - 22, 2020 - Cincinnati, OH  
 IDEA - Jun. 22 - 25, 2020 - Washington, D.C.

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We have 3 recommendations.  
First, pay special attention to the area where you're placing the boiler...even if it's an emergency situation.

A little planning up-front can save a lot of hassle (and money) later.

Make sure you park the unit on level ground. And make sure you park it on solid ground. Make sure you don't park it over a septic tank, cistern, or any other below-ground objects.

Second, check every day to ensure the boiler stays level.

Use a level to check both front-to-back and side-to-side. This quick check can tell you if your boiler is headed for trouble or not.

Do this check every single day. Because when a boiler is not level, it can cause problems in a matter of hours -- days at most. These things happen fast.

And third, use hard wood (like oak) timbers under the boiler's rails to shim it up or keep it level.

You can also use steel plates to do this. And they're especially helpful if you have a temporary unit in a semi-trailer, as it will spread the weight out across the surface of the plates.

Here's the good news:

With a little planning, you can prevent these problems from happening in the first place.

In an emergency situation, speed is important, but safety is more important. Take your time and consider everything when you decide where to place your temporary boiler.

It's not just about connecting pipes. It's about safety.

So it's worth a small investment to hire a professional to do the patch. Because a repair fee pales in comparison to a replacement fee.

And when you add in the extra cost of having your facility down and out-of-production for multiple days...

You're looking at a much higher cost than you might have expected.

So it's worth it to hire a professional for more serious patches.

Your boiler's refractory plays an important role in your facility's operations. So make sure you do what you can to protect it.

 **Watch** **Shocking Steam Boiler Refractory**  
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 channel



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