

MiURA

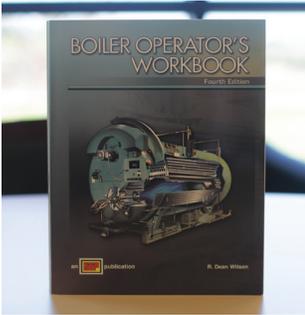
SAFETY



Safer By Design



SAFETY IS A MATTER OF PHYSICS



In his book, *Boiler Operator's Workbook*, a well-accepted reference tool, the author R. Dean Wilson writes "Why is an explosion generally less disastrous in a watertube boiler than in a firetube boiler?"

"In a watertube boiler, the large volume of water is distributed into many small tubes, and the volume of water in the drum is comparatively small (low water content). If one water tube bursts, the pressure in the entire pressure vessel is bled off slowly, and the tendency of the large body of water to flash into steam is minimized. Usually only one watertube bursts. This may steam-cut a small number of nearby water tubes.

"In a firetube boiler, a sudden crack in the shell or a flue pulled loose at the end causes the entire body of water to be subjected to a sudden and substantial drop in pressure. The huge volume of flash steam that results can cause an explosion of tremendous force."

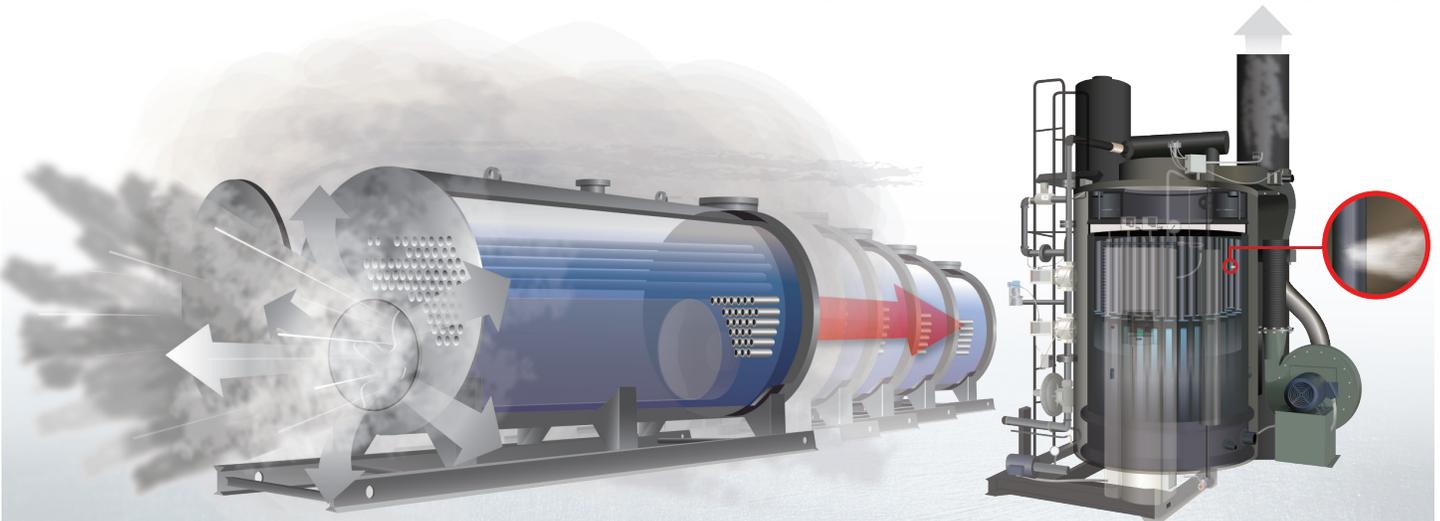
With more than 140,000 units in operation, Miura's once-through, watertube boilers have experienced zero catastrophic vessel failures resulting in casualty.

THE BENEFITS OF LOW WATER CONTENT

A food and beverage processing expert, who has been around both firetube and watertube boilers, notes: "I think Miura's ultra-low water design and once-through operation means that this (an explosion) never has to be a consideration. There's no fear of impending doom that the boiler's going to explode and fly 800 feet into the residential area."

Other experts agree and yet, myths remain about this unique safety feature and efficiency advantage. Some say that low water content boilers lack steam space and the ability to maintain pressure. While it is true that low water content boilers do have a smaller steam space, this also allows them to respond much faster to demand swings compared to firetube boilers. Miura boilers can go from cold to full steam in less than 5 minutes, and a properly sized Miura modular boiler system will have no issues maintaining pressure settings.

Another misconception is that water chemistry is very difficult to maintain in a low water content boiler. All Miura boilers come standard with an automatic surface blowdown system that aids in proper water treatment and simplifies the chemical dosing process. (Miura also provide a full line of chemicals, chemical injection systems and water softeners to further simplify the water treatment process.) Plus, Miura's water treatment components can be integrated using Miura's controls and monitoring packages.



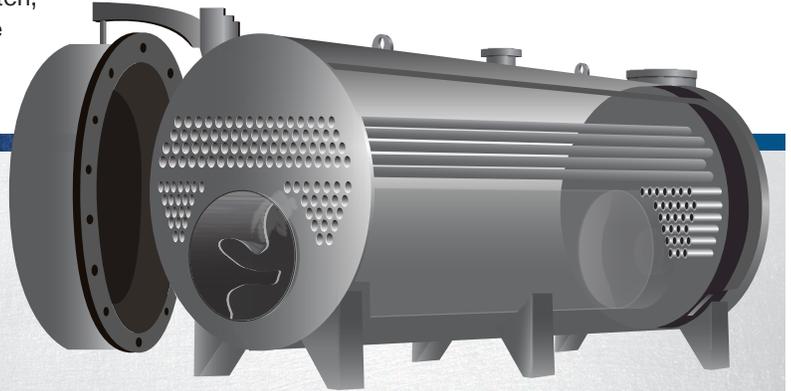
HIGH on LOW WATER:

Miura's low water content boilers have a smaller steam space that allows them to respond much faster to demand swings compared to firetubes, going from cold to full steam in less than 5 minutes. Properly-sized, there are no issues maintaining pressure.

SAFETY IS A MATTER OF PHYSICAL DESIGN

Day-to-day safety concerns and the range of injuries that can result from installation, operation, and routine maintenance are less about physics and more about how a boiler is designed and engineered, including size and weight factors, ease-of-maintenance, accessibility to gauges, and a host of other issues that may increase the potential for injury.

Consider, for example the enormous weight of doors that must be opened and closed during routine maintenance of traditional firetube boilers. Mounted on a davit arm with heavy steel on the front and refractory in the back, these doors can weigh thousands of pounds and present enormous physical challenges. Often, jacks are required to line up the doors so bolts can be screwed in using an impact wrench while standing on a ladder, another safety concern.



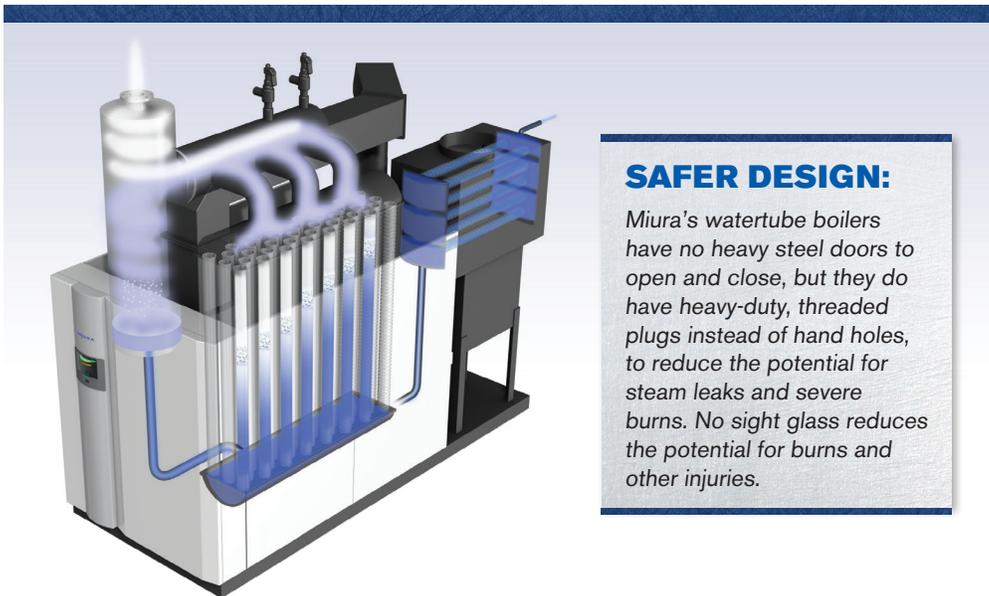
SAFETY CONCERN:

Traditional firetube boilers have enormously heavy steel doors, weighing thousands of pounds that must be opened and carefully lined up for closing during routine maintenance. Technicians often perform many functions while climbing up and down ladders.

The potential for injury, based on this demanding procedure, can result in back problems due to heavy lifting; finger trauma and amputation due to doors shifting while trying to line up holes; falling from the ladder due to required body manipulation to start bolts with an impact gun; finger lacerations due to replacing gaskets, eye injury due to gasket pins flying off, and more.

While every responsible company provides their staff with safety equipment, firetube boilers have extremely heavy doors, as opposed to watertube boilers, like Miura, which have none.

MIURA'S EVERYDAY SAFETY ADVANTAGES



SAFER DESIGN:

Miura's watertube boilers have no heavy steel doors to open and close, but they do have heavy-duty, threaded plugs instead of hand holes, to reduce the potential for steam leaks and severe burns. No sight glass reduces the potential for burns and other injuries.

Miura's unique physical design and innovative engineering offer users a number of other safety and efficiency advantages over traditional firetube boilers, which include: Heavy duty, threaded plugs, instead of hand holes that reduces the potential for steam leaks and subsequent severe burns; a clean, open environment, which results in no clutter, easy to read gauges, and easy to perform water checks; no confined space entry requirements, simpler testing, full steam in 5 minutes, and more. In short, Miura's technology reflects some of today's most notable safety and efficiency advances.

When asked about day-to-day safety issues, one expert who recommends boilers based on functionality first, maintenance and sanitation second, form third, and safety always, stated: "When things are hard to get to, people don't always do them. If it's really hard to get to, people can get hurt, because they have to reach into things. With Miura, the design and layout of all the touch points makes sure that my operators, or myself, don't come out with battle scars, so to speak, on our arms."

MIURA TAKES SAFETY TO THE NEXT LEVEL

Miura boilers are “Safer By Design,” with a manufacturing philosophy that puts safety first and builds innovative technology around it with respect for energy, water, and the environment.

The company, first established in 1927, has become a world leader in the steam boiler industry and among the fastest growing brands in North American market share.

For Reliability, Efficiency and Safety, more and more steam boiler users choose Miura.

✘ Unavailable ○ Optional ✓ Standard ✓✓ MIURA Outperforms ○ (Optional) MIURA Outperforms

Type of Controls	Effectiveness	Control Methods	Industry Standard	MIURA
Elimination	Best	Reduced Water Content	✘	✓✓
		Reduced Furnace Volume	✘	✓✓
Substitution	Better	Water Tube Design	○	✓✓
Engineering Controls	Good	ASME Pressure Vessel	✓	✓
		UL Approved Controls	✓	✓
		Purge/Ventilation Requirements	✓	✓
		Gas and Air Pressure Switches	✓	✓
		Shut Off Valve With Proof of Closure	✓	✓
		Air Proving	✓	✓
		Flame Scanner	✓	✓
		Two Low Water Cutoffs	✓	✓
		High Pressure Cut-Off Switches	✓	✓
		Safety Relief Valves	✓	✓
		Water Tube Overheat Cut-Off	✘	✓✓
		Flue Gas Overheat Cut-Off	✘	✓✓
		Scale Monitor	✘	✓✓
		Water Pump Capacity Monitor	✘	✓✓
		Automatic Surface Blowdown	○	✓✓
		Automatic Bottom Blow-Off	✘	○
		Water Softener Communication with Boiler	✘	○
		Administrative Controls	OK	State / Insurance Inspections
Preventative Maintenance	✓			✓
Fully Test Packaged Boiler at Factory	○			✓✓
Manufacturer Remote Monitoring and Over the Phone Preventative Maintenance	✘			○
PPE	Worst	Safety Glasses, gloves, long sleeves, etc.	✓	✓



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