

MADDEN

ENGINEERED PRODUCTS

BOILER BLOWDOWN TANK – OWNER’S MANUAL



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MADDEN ENGINEERED PRODUCTS

Traditional Boiler Blowdown Tanks

Purpose and Function

Madden Boiler Blowdown Tanks provide a safe, simple, and proven method for cooling and discharging intermittent boiler blowdown. In comparison to a boiler blowdown separator (small flash tank with drain line aftercooler), traditional overflow style tanks offer a longer service life and use significantly less cold water injection. If designed properly, the larger diameter of a traditional blowdown tank will reduce flash steam expansion rates, extending service life, and will cool the effluent via natural convection, reducing the need for tempering water.

Flash Separation: When bottom blowdown enters, flash steam is released to atmosphere through the vent.

Cooling by Retention: Remaining hot condensate is retained for 6–12 hours, cooling naturally before being displaced through the overflow outlet.

Discharge: The next blowdown mixes with cooled retained water, ensuring the effluent leaving the overflow drain is ≤ 140 °F, compliant with sewer and safety codes.

Typical applications: industrial and commercial boiler rooms requiring code-compliant disposal of hot boiler blowdown.

Design and Construction

Fabricated to ASME Sec. VIII, Div. 1 standards.

Design and working pressure: Designed to ASME BPVC for 50 PSIG @ 450 deg F, typically operates at 0-2 PSIG.

Typical shell and head material: SA516 (or SA455) Grade 70 Carbon Steel, painted with red oxide primer on exterior only.

Configured with:

- Centrifugal inlet(s) with carbon steel wear plate (304SS available as option)
- Vent outlet, Overflow outlet, and Cleanout Drain connection
- Lifting lugs and (4) support legs with footpads
- 12" x 16" manway
- Various coupling connections for pressure gauge, sight glass and valve set, temperature gauge and/or temperature sensing equipment.
- If continuous surface blowdown or D/A overflow process lines are also piped to the tank, Madden will size and provide a drain line aftercooler to temper these additional flows where natural convection may not sufficiently reduce discharge to ≤ 140 °F.

Safety Information

 Important: Always follow OSHA and facility safety procedures when operating blowdown equipment.

- Do not exceed the tank's rated pressure or temperature.
- Only one boiler may be blown down at a time.
- Ensure the vent is piped to a safe location where flash steam will not endanger personnel.
- Verify cold water supply (if aftercooler is included) is adequate before extended blowdown.

Installation Guidelines

Inspection: Upon receipt, check for shipping damage or nonconformities. Contact Madden before installation if any issues are found.

Mounting: Lag the vessel securely to the floor or skid. Use the provided support leg bolt holes.

Connections:

- Vent: Pipe to atmosphere in a safe location.
- Overflow Drain: Pipe to city sewer or floor drain per local codes.
- Inlet(s): Connect boiler blowdown piping to centrifugal inlet.
- Quench Line (if equipped): Include Y-strainer, self-operating valve, check valve, and bypass as recommended.

Operation

Initial Blowdown Test: Blow down for 10–20 seconds. Confirm tank does not fill above overflow level. If equipped with aftercooler, confirm cold water valve actuates.

Normal Operation: Perform blowdowns per boiler manufacturer's recommendations. Allow 6 hours minimum between blowdowns for natural cooling.

Drainage: The overflow outlet automatically discharges cooled condensate. The bottom drain can be opened periodically for maintenance or full tank emptying.

Recommended Inspection & Maintenance

Task	Frequency	Notes
External visual inspection	Monthly	Check for leaks, corrosion, or abnormal vibration
Overflow outlet flow check	Quarterly	Confirm unobstructed discharge
Vent piping inspection	Quarterly	Ensure vent line remains clear and safely directed
Internal inspection (via manway, if equipped)	Annually	Look for corrosion, scale, or sediment buildup
Drain valve exercise	Annually	Verify smooth operation

Drain Frequency: Routine draining is not required beyond the overflow function. Use manual drain if sediment buildup is observed or during annual inspection.

Troubleshooting Guide

Issue	Possible Cause	Corrective Action
Effluent >140 °F	Insufficient cooling time or high frequency blowdowns	Increase interval between blowdowns; confirm overflow mixing
Overflow not discharging	Blockage in drain piping	Inspect and clear line
Excessive steam release	Vent piping inadequate	Verify vent routing and size per design engineer
Corrosion observed	Improper water chemistry or exposure	Consult water treatment provider; schedule repair/refurbishment

Storage & Handling (Pre-Installation)

Store indoors whenever possible.

If outdoors: cover with a tarp and ensure paint coating is intact.

Handle with forklift or lifting equipment sized appropriately.

Service & Support

For technical assistance, spare parts, or service inquiries:

Phone: (574) 295-4292 (8:00 am – 4:30 pm EST)

Email: info@maddenep.com or sales@maddenep.com

Warranty

Warranty of Seller's Products – Except where a different express warranty has been issued with respect to a particular product, no warranty of any kind, express or implied, is extended by the Seller to any person or persons other than its direct Buyers. To direct Buyers, the Seller warrants only that it will furnish by freight a replacement for, or at its option repair, any product of its manufacture or part or portion thereof, proved to its satisfaction to be defective in material or workmanship under normal use and service (i) within a period of eighteen (18) months from date of shipment or (ii) within one year from the date all other equipment or part thereof is first placed in use. These warranty terms apply only to Seller's equipment manufactured at the Elkhart, IN facility. Any ancillary components sourced from another vendor will be subject to said vendor's standard warranty terms and conditions. See note "Goods of Other Manufacturers" below.

The Seller shall have no responsibility for the performance of any product sold by it under conditions varying materially from those under which such product is usually tested under existing industry standards, nor for any damage to the product from abrasion, erosion, corrosion, deterioration or the like due to abnormal temperatures or corrosive fluids or the influence of foreign matter or energy, or flow induced vibration caused by associated equipment or external influences; nor for the design or operation of any system of which any such product may be made a part or for the suitability of any such product for any particular application. The Seller shall not be liable for any cost or expense, including, without limitation, labor expense, in connection with the circumstances for any damage beyond the price of the goods sold. Any freight allowance in connection with a replacement will be on the same terms as were applicable to the original sale, except that a replacement for a product or part or portion thereof which is proved to the Seller's satisfaction to be defective in material or workmanship as provided herein above, will in any event be furnished with freight (but not local cartage) allowed, within the country of origin, to the first destination. Any substitution of parts not of Seller's manufacture or not authorized by Seller, or any modification, tampering, or manipulation of Seller's product, shall void the warranty.

Other Warranties – The foregoing warranty is in lieu of all other warranties of any kind, express or implied, and of all other obligations or liabilities, on the part of the Seller. The Seller neither assumes, nor does it authorize any other person to assume on its behalf, any other liability in connection with the sale of its products. Seller expressly disclaims the implied warranties of merchantability and fitness for a particular purpose.

Goods of Other Manufacturers – Goods of other manufacturers sold by the Seller are not warranted except by express warranties which may be issued in writing from time to time with respect to a particular product or a particular sale; but the Seller will endeavor to secure for its direct Buyers the benefits of warranties extended by the manufacturers of such goods sold but not manufactured by the Seller.



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