

**Madden is an industry leader in the process of designing and fabricating of blowoff vessels.**



The boiler room has many hot, high pressure water lines that often need a safe place to be discharged to. The blowdown process is relatively violent and yields flash steam. ASME Pressure vessels are sized and used to safely contain and cool this process.

Madden personnel are experts in designing custom blowoff vessels to handle a variety of processes. Whether your application needs to handle standard intermittent bottom boiler blowdown only, or boiler blowdown along with several other processes, such as D/A tank overflow and condensate return lines, Madden can help design an appropriate tank.

Madden focuses on designing cost effective, but reliable and safe vessels. You can rest assured boiler room personnel, other boiler room equipment, and your discharge sewer system will all be safe from this violent blowdown process.

Madden Blowdown Tank and Design Service Features:

- ✓ **RESPONSIVE:** We design and quote very quickly. Sizes and prices often returned the following day after request.
- ✓ **INDUSTRY EXPERTS:** Extensive knowledge and experience with the NB-27 guide for designing blowoff vessels. The National Board of Pressure Vessel's latest edition. Madden has been designing boiler blowdown equipment since 1953.
- ✓ **UP TO CODE:** Madden BD Tanks are made to the latest ASME code for Sec VIII, Div. 1.
- ✓ **CUSTOMIZATION FRIENDLY:** Almost all Madden tanks nowadays are built to order to meet the specific boiler room's needs.
- ✓ **ANCILLARY EQUIPMENT:** Madden can provide any and all equipment to provide a complete, turnkey blowdown solution. Including but not limited to: aftercoolers for added quenching, quenching calculations, sight glass and valve set, pressure gauge, cleanout drain and gate valve system, insulation, and more.
- ✓ **COMPLETE BLOWDOWN SOLUTIONS:** Madden offers a wide variety of boiler blowdown equipment. If you have other requirements or interests such as surface blowdown heat recovery, sample cooling and analysis, or chemical injection systems, we have you covered.

**PROPOSAL SPECIFICATION No. (year)-(date)**  
**INTERMITTENT BLOWDOWN TANK**  
**MODEL BD \_\_\_\_\_**

*(For P/N, Enter #'s for diameter, seam to seam dimension, and client initials and design number if needed)*

The contractor shall furnish and install a Blowoff Tank, as manufactured by Madden Engineered Products, LLC., Elkhart, IN. This equipment will be constructed in accordance with National Board Rules, standards of the A.S.M.E. Code for Unfired Pressure Vessels for 50 p.s.i.g. pressure, and it will have the "U" stamp and National Board serial number.

The tank shall consist of:

- A.) Vertical flash tank, Model No. BD\_\_\_\_, \_\_\_\_" diameter x \_\_\_\_" OAH (\_\_\_\_" X \_\_\_\_" sm-sm) with the following features:
1. Centrifugal blowdown inlet: \_\_\_\_" MNPT Sch 80 SA106 Pipe (Sch 80 is standard, other available by request)
  2. Inlet Wear Plate: 3/8" X 12" X 180 deg, Carbon Steel (other materials available upon request).
  3. Vent: \_\_\_\_" Class 150 RFSO flange (\_\_\_\_ fps velocity) with Sch 40 \_\_\_\_" SA106 pipe
    - i. NOTE: The National Board's NB-27 Guide for pressure vessels suggests sizing the vent to reduce the steam velocity to *approximately* 50 FPS. Madden recommends vents to be sized to reduce vent velocity below 300 FPS.
  4. Drain: \_\_\_\_" Class 150 RFSO flange (\_\_\_\_ fps velocity) with Sch 40 \_\_\_\_" SA106 pipe
  5. Manhole: 12" X 16"
  6. Tank legs (4) with foot plates: elevate tank bottom 12" from floor
    - i. Includes (4) foot pads, \_\_\_\_" x \_\_\_\_" with \_\_\_\_" bolt hole.
  7. Construction: SA516 (or SA455) Gr 70 Carbon Steel, standard thickness will meet minimum ASME requirement for BPVC of 50 PSI design + approximately an 1/8" round-up for corrosion allowance.
    - i. NOTE: Alternative thickness - 3/8" with 1/8" CA for added tank service life. **Request if desired.**
  8. Finish: red/brown oxide primer (other paint finishes available upon request).
  9. Sight glass and brass valve set connections (2): 3/4" FNPT, CS, 3,000# couplings.
  10. Pressure gauge connection: 1/4" FNPT, CS, 3,000# couplings.
  11. Typical Ancillary Equipment Offered by Madden:
    - a. Pressure Gauge: 1/4" NPT, 4" dial, 0-50 PSI, SS material, includes pig tail.
    - b. Valve Set and Sight Glass: 3/4" MNPT brass valves, glass gauge is 21.5" long, valve set includes vent and drain.
    - c. BD Tank Cleanout Drain Equipment: Gate Valve, Milwaukee, Bronze, 2" FNPT x FNPT, will include pipe and fitting to extend valve out from under tank cleanout drain, pipe painted with red oxide primer.
    - d. Aftercooler and cold-water supply line. Used to quench continuous blowdown flows or as an additional safety feature to ensure discharge water does not exit building hotter than 140 deg F. Standard intermittent bottom boiler blowdown processes and appropriately designed tanks should not require this equipment if only bottom boiler blowdown is being sent to the tank. **Standard BD tank systems are intended to cool via natural convection, typically over 4 to 8 hours depending on the parameters. However, if desired or required, note below sections.**
    - e. For additional ancillary equipment please send specifications to the factory.
- B.) (Optional) Aftercooler Package (used when other blowdown processes are also entering vessel): P/N, AC\_00, \_\_\_\_" Sch 40, A-53 pipe.
1. Inlet & Outlet: \_\_\_\_" Class 150 RFWN (inlet) & RFSO (outlet) flange connection with 4" sch 40 elbow
  2. After cooler pipe: \_\_\_\_" diameter X 19" length, A-53 pipe, sch 40, with following connections:
    - a. Cold water supply: \_\_\_\_" FNPT, 45 deg angle, class 300 coupling
    - b. Temperature Gauge: 1/2" FNPT, class 300 cplg, includes 3" dial analog gauge, 1/2" NPT connection, 0-240 deg F, SS, Weiss brand
    - c. Temperature Sensing Probe Connection: 1" FNPT, 45 deg angle, class 300 cplg
  3. Temperature Regulating Valve, self-operating, \_\_\_\_" FNPT x FNPT, \_\_\_\_ Cv, (single or double seated design), bronze body and copper temperature sensing probe. Madden P/N AC10\_.
- C.) (Optional) Cold Water Supply Spool to feed cold water into after cooler:
1. Supply spool piping to be \_\_\_\_" Class 150/Sch 40 piping and fittings.
  2. Valves included: (2) \_\_\_\_" Bronze Class 125 FNPT isolating gate valves, (1) \_\_\_\_" Bronze Class 125 FNPT globe valve, (1) \_\_\_\_" Bronze Class 125 FNPT Y-strainer and (1) \_\_\_\_" Swing type Bronze Class 125 FNPT check valve
  3. (2) Adjustable steel support legs with footpads will be provided
  4. NOTE: Assembly as quoted to be performed by Madden.
  5. NOTE: Cold water supply spool pressure drop estimated to be \_\_\_\_ PSI.

The Contractor will furnish and install all related piping, fittings and valves to provide a complete system. This includes piping from the boiler blowdown valves, vent piping from the tank for the flash steam, and piping from the overflow drain and cleanout drain. The Contractor will be responsible for installing the sight glass at the job site.

