

# MADDEN

MANUFACTURING, INC.

*Simple, Rugged Quality*

## Centrifugal Blowdown Separators and Tanks

### Centrifugal Blowdown Separators \_\_\_\_\_

**Function:** Madden Blowdown separators are designed to immediately dispose of hot, high pressure boiler blowdown. When the hot, high pressure bottom blowdown from the boiler enters the separator's low pressure vessel, flash steam is created and vented to the atmosphere. The remaining hot bottom blowdown drains out the vessel to the aftercooler. A temperature regulating valve on the aftercooler opens a cooling water valve. This results in the immediate mixing of cold water and the hot bottom blowdown to a temperature  $\leq 140^{\circ}$  Fahrenheit.

**Selection Guide:** To select the proper blowdown separator for your application, you need to know both the boiler operating pressure and the size of the bottom blowdown connection. Using those two figures, you can match the bottom blowdown inlet on the blowdown separator to the boiler blowdown connection size from the table on page 2. For example, the proper blowdown separator connection for a 125 psi boiler with a 1-1/2" bottom blowdown connection, you'll need model number BD230D45. The aftercooler size is determined by the size of the drain in the blowdown separator. The temperature regulating valve sizing is dependent on the cold water inlet on the aftercooler selected. For sizing on blowdown tanks, or for blowdown separators for boilers over 300 psi, contact the factory. All connections 2-1/2" and smaller are NPT, 3" and larger are 150 psi RF flanged. These are the standards, customized connections available upon request. *See page 3 for system drawing and dimensions.*

**Data Required:** Blowdown Pipe Size \_\_\_\_\_ Boiler Pressure \_\_\_\_\_ psig

# Centrifugal Blowdown Separators and Tanks

## Blowdown Tanks

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**Function:** Blowdown Tanks are used as an alternative system for cooling the bottom boiler blowdown. These large tanks retain the blowdown water volume from one blow after the flash steam has been vented to the atmosphere and allow the water to cool down by natural convection over a 6-12 hour period. This retained water that did not reach the tank's overflow drain will be close to room temperature when it is displaced by the next blowdown. The resulting mixture of retained water and new blowdown entering the tank will be  $\leq 140^{\circ}$  Fahrenheit as it is displaced out of the overflow drain. *See page 5 for details of construction.*

**Selection Guide:** To select the proper blowdown tank for your application you need to know the boiler operating pressure, the size and type of the bottom blowdown connection, the equivalent length to the tank, and the boiler's steam drum diameter and length. *Contact the factory for assistance.*

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## Features of Blowdown Separators and Tanks

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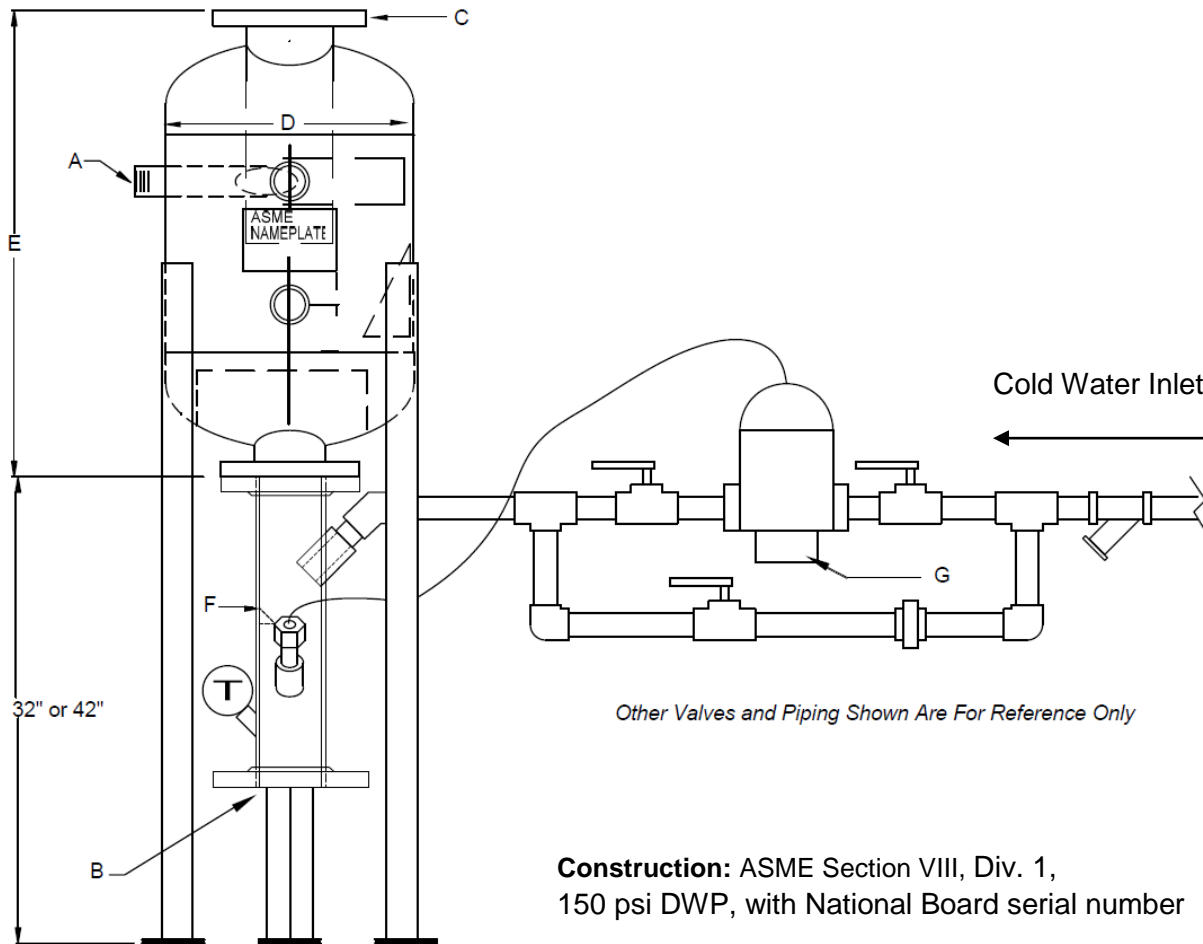
### Blowdown Separators

- Cools bottom boiler blowdown to safe temperatures
- Compact design saves floor space
- Lower cost than most blowdown tanks
- Immediate disposal of intermittent bottom boiler blowdown

### Blowdown Tanks

- Cools bottom boiler blowdown to safe temperatures
- Designs available for boilers operating above 300 psi
- Uses natural convection to cool intermittent bottom boiler blowdown, installation of other accessories not needed

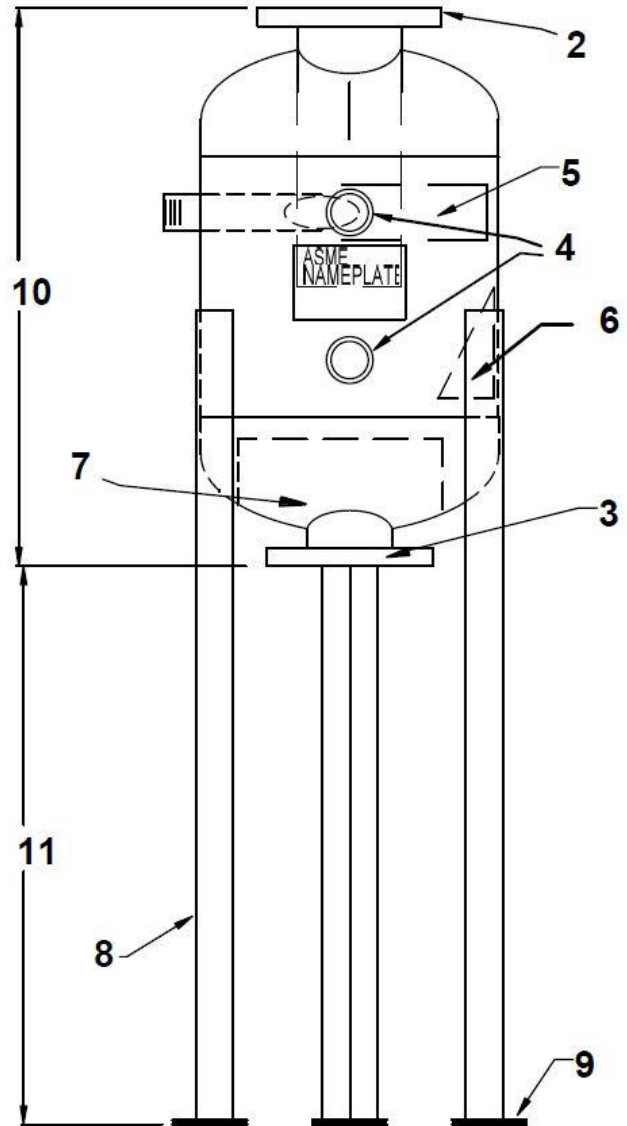
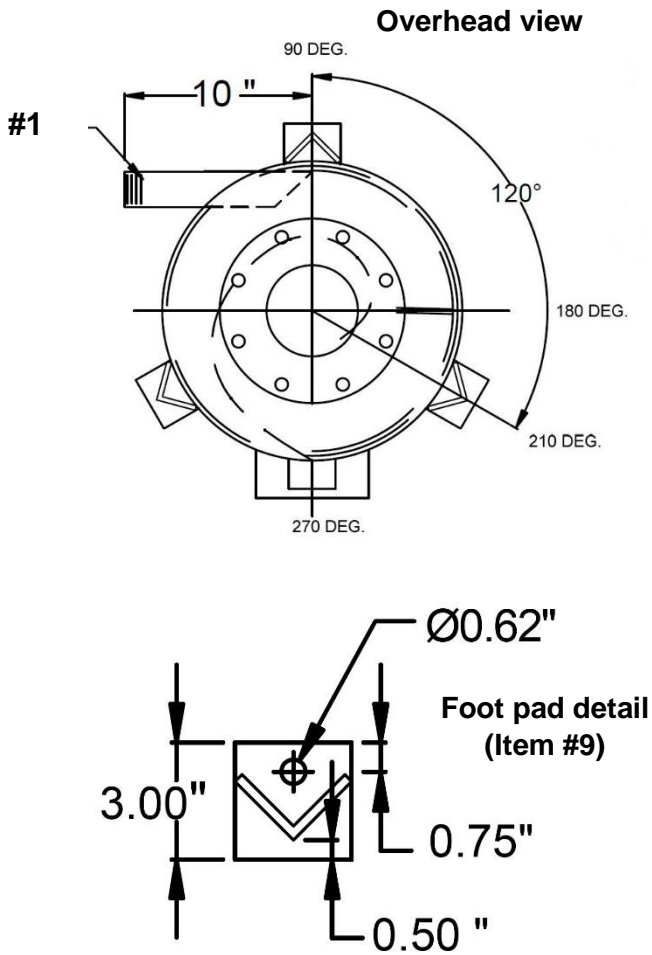
# Centrifugal Blowdown Separator Installation



Blowdown Separator Model #	Blowdown Inlet -A-	Blowdown Drain -B-	Vent -C-	Vessel Diameter -D- x Height -E-	Aftercooler Part No. -F-	Cold Water Inlet Size	Aftercooler Size	Regulating Valve Number	Valve Size -G-
<b>Boilers Up To 150 psi.</b>									
BD130A22	3/4"	2-1/2"	2-1/2"	10" x 30"	AC200	3/4"	2-1/2"	AC102	3/4"
BD130B23	1"	2-1/2"	3"	10" x 30"	AC200	3/4"	2-1/2"	AC102	3/4"
BD230C44	1-1/4"	4"	4"	16" x 30"	AC400	1-1/4"	4"	AC104	1-1/4"
BD230D45	1-1/2"	4"	5"	16" x 30"	AC400	1-1/4"	4"	AC104	1-1/4"
BD230E55	2"	5"	5"	16" x 30"	AC500	1-1/2"	5"	AC105	1-1/2"
<b>Boilers Up to 300 psi.</b>									
BD242A34	3/4"	3"	4"	16" x 42"	AC300	1"	3"	AC103	1"
BD242B44	1"	4"	4"	16" x 42"	AC400	1-1/4"	4"	AC104	1-1/4"
BD242C45	1-1/4"	4"	5"	16" x 42"	AC400	1-1/4"	4"	AC104	1-1/4"
BD242D45	1-1/2"	5"	6"	16" x 42"	AC500	1-1/2"	5"	AC105	1-1/2"
BD242E68	2"	6"	8"	16" x 42"	AC600	1-1/2"	6"	AC105	1-1/2"

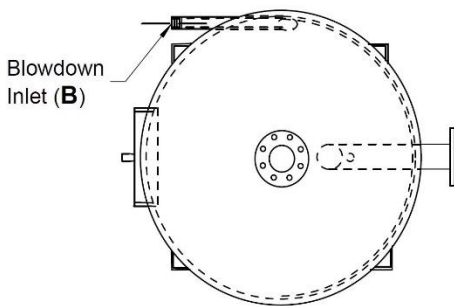
**NOTE:** Blowdown separators come with legs. Mounting brackets for attaching the blowdown separator to supporting structures provided by the owner are also available as an option.

# Centrifugal Blowdown Separator



Item	Description	Item	Description
#1	___" NPTF Blowdown Inlet Connection	#7	Spiral Baffle, Stainless Steel
#2	___" Vent Connection, 150 psi R.F. Flange	#8	Legs with Foot Pad
#3	___" Drain Connection, 150 psi R. F. Flange	#9	Foot Pad
#4	2" NPTF Inspection Opening	#10	Vessel Height: ___ 30" ___ 42"
#5	Impingement Plate, Stainless Steel	#11	Leg Height: ___ 30" ___ 42"
#6	Wall Baffle, Stainless Steel		

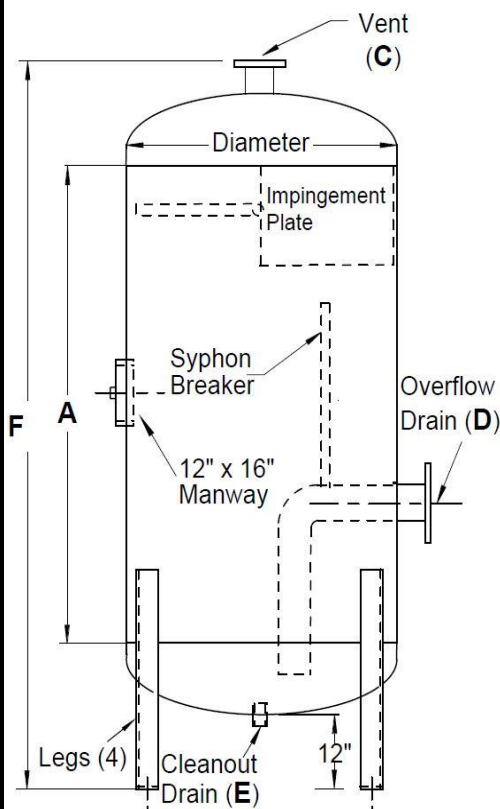
# Centrifugal Blowdown Tanks



These heavy steel tanks receive the bottom blowdown water from a boiler and cool it down using the flash steam principle, along with convection cooling over several hours for the retained hot water. The tank is designed to breakup the blowdown flow by impacting the high pressure hot water on the steel centrifugal impact plate. The water droplets give up heat as flash steam is formed. The flash steam is vented from the top of the tank to the atmosphere. Retained water displaces cooled water from the previous blowdown, and is retained in the tank until it cools to the statute limits.

## Data required for sizing calculations:

- Blowdown pipe size, type and equivalent length to tank.
- Boiler steam drum diameter & length.
- Boiler operating pressure



Model Number	Diameter	Shell A	NPT B	150#RF C	Flange D	NPT E	OAH F
BD1600	16"	35.5"	Up to 2"	*2-1/2"	*2"	2"	66"
BD2400	24"	32"	Up to 2"	*3"	*2"	2"	66"
BD3000	30"	29"	Up to 2"	4"	*2"	2"	66"
BD3600	36"	30"	Up to 2"	4"	3"	2"	70"
BD4200	42"	42"	Up to 2"	5"	3"	2"	85"
BD4800	48"	48"	Up to 2"	6"	4"	2"	94"
BD5400	54"	66"	Up to 2"	6"	4"	2"	116"
BD6000	60"	72"	Up to 2"	6"	4"	2"	125"
BD7200	72"	96"	Up to 2"	10"	4"	2"	155"

\*These connections are NPT

- Shell length (Dimension A) and connections size dimensions can be changed to meet the application requirements for the specific boiler as determined by design rule calculations.
- Sizing of tank and connections should be determined using National Board design rules for blowoff tanks.  
*Contact the factory for assistance.*
- Construction: ASME Section VIII, Div. 1, 50 psi DWP, with National Board serial number

# MADDEN

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**Form BDS16**

Contact your Sales Representative for detailed information on these other high quality Madden products: Diaphragm Metering Pumps, Chemical Feed Systems, Orifice Meters for continuous blowdown controls, and Sample Coolers.