

## Bulletin No. 220

### Bottom Drain Valves

Guide for selecting bottom drain valves.

Bottom drain valves can be added to most Parr reactors. These valves are particularly useful for those working with polymers or other material that must be discharged from the reactor while they are still hot and before they can solidify. These valves are also quite useful for the 1 gallon and larger vessels which are too large to conveniently lift from the heater for product recovery.

Until recently, bottom drain valves were rarely installed on the micro and mini reactors because of their small volumes and light vessel weights. The A485VB Bottom Drain Valve was specifically designed for Mini Reactors from 100 mL to 600 mL volumes.

The standard bottom drain valve is a rising stem, process sampling valve. In the closed position the stem of the valve is flush with the inside bottom of the vessel so that there is a minimum of dead space between the bottom of the vessel and the shut off point of the valve. In the fully open position the stem is retracted completely to open a clear passage from the vessel. When the valve is re-closed, any material in this passage will be pushed back into the reactor by the rising stem.



A465VB Bottom Drain Valve



A485VB Bottom Drain Valve



Valves with 3/8 inch diameter clear passage are recommended for vessels with volumes from 1 liter to 2 gallons. A 1/4 inch valve is available for 600 mL and smaller vessels. High pressure and larger diameter valves are available where required.

These valves will withstand the full operating pressures and temperatures of the vessels in which they are installed. They are available in nearly all of the current materials of construction for Parr vessels.

Users can also specify that a reactor have a tapered bottom so that it will drain easily through the valve opening.

Not all Parr reactors will accept a bottom drain valve. Since some of the valves may extend up to 8 inches below the bottom of the vessel, the entire vessel must be raised by this amount to accommodate the valve. This makes some models too tall for convenient bench top operation. The specification tables for each model (see 4500 Stirred Reactors and Pressure Vessels Catalog) will identify those reactors in which a bottom drain can be readily installed, and those which will not accept a bottom drain, or those which will require custom modification of the heater and support stand to accommodate a bottom valve.

#### **Needle Valves and Ball Valves:**

Needle valves and ball valves can also be installed as bottom outlet valves. Needle valves are generally used on the smaller reactors. Needle valves will have some dead space when used for a bottom drain.

Ball valves can be used for large discharge passages. They are, however, generally limited in their operating temperature/ pressure capabilities and they leave a fairly large dead space between the bottom of the vessel and the seat of the valve.

**Bottom Drain Valves for Parr Vessels:**

<i>Part No.</i>	<i>Opening Diameter -Inch</i>	<i>Outlet Connection</i>	<i>Max. Pressure psi</i>	<i>Max. Temp. °C</i>
A485VB	0.25	1/4 NPT (F)	3000	225
A485VB2	0.25	1/4 NPT (F)	3000	350
A465VB	0.38	3/8 NPT (F)	2000	350
A177VB	0.31	3/8 NPT (F)	5000	500
A285VB	0.38	1/2 NPT (F)	1900	265
A296VB	0.69	1" NPT (F)	1900	265

### Heated Bottom Drain Valves for Parr Vessels:

<i>Part No.</i>	<i>Opening Diameter -Inch</i>	<i>Outlet Connection</i>	<i>Max. Pressure psi</i>	<i>Max. Temp. °C</i>
A580VB	0.38	3/8 NPT (F)	2000	350

#### Heated Valve Available:

We have recently designed the A580VB bottom drain valve with heating element. This valve was designed for applications where polymers would set up in the valve if it were not heated. This valve is offered as an alternative to the A465VB Valve with 3/8 inch NPT Thread and 0.375 inch diameter opening. The valve includes a 210 watt heater and a thermocouple to sense the temperature of the valve. Multiple control options are available to control the temperature of this valve depending upon the control configuration of the reactor upon which it is installed.



A580VB Heated Bottom Drain Valve

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