

Lab-Crest Glass Pressure Reaction Vessels

Pressure Reaction Vessels (PRV) Applications

Visual observation of a pressurized system is one of the major advantages of Lab-Crest glass pressure reaction vessels. Chemically inert borosilicate glass construction allows you to accurately and safely observe:

- Solubility of gases in liquids at increased pressures
- Chemical behavior of liquids and gases subjected to temperature and pressure changes
- Effect of liquids on metals
- Purity of propellant batches
- Spray and pressure characteristics
- AKA Fischer-Porter Bottles

Typical applications include hydrogenation, polymerization, catalysis, and isomerization. Pressure reaction vessels are available in three standard sizes: 3-ounce, 6-ounce, and 12-ounce. All vessels are PVC coated for protection, marked with a millimeter reference scale, and individually pressure tested.

Multi-Ported Stirring Assemblies are available for gathering chemical reaction data on heterogeneous materials. This 12-ounce vessel with a rugged head and stirrer assembly provides controlled constant stirring capability and easily handles highly viscous materials. It enables use of pressure control gauges and temperature probes. Samples can be easily injected or extracted.

Multi-Ported Stirring Assemblies with Assorted Accessories



Assembly Instructions for Lab-Crest Pressure Reaction Vessels

I Assembly of Couplings on 3 oz, 6 oz, and 12oz Vessels:

- A. Slide Male Coupling (1106500001) over neck of Vessel.
- B. Spread open Polyethylene split-ring Insert (1107590001) and slip over neck of Vessel.
- C. Place O-Ring (1108580001) on rim of Vessel.
- D. Bring Male Coupling and Insert up to angle and place Female Coupling (1106010001) over O-Ring. Screw Couplings together.

II Assembly of Needle Valve Adapter (1109570001):

- A. Place O-Ring (1109990001) in groove on base of Stainless-Steel piece.
- B. Place Rubber Washer (1109730001) on at section of stainless-steel piece just above O-Ring.

III Assembly of Coupling and Needle Valve Adapter to Glass Vessels:

- A. Slide Male Coupling (1106500001) over neck of Vessel.
- B. Spread open Polyethylene split-ring Insert (1107590001) and slip over neck of Vessel.
- C. Push assembled Needle Valve Adapter (1109570001) into neck of Vessel. Push straight, with even pressure to seat O-Ring and washer onto glass surfaces.

SAFETY NOTE: WEAR GLOVES AND SAFETY GLASSES WHEN PUSHING OBJECTS INTO GLASS VESSELS.

- D. Place O-Ring (1108580001) on top of Needle Valve Adapter.
- E. Bring Male Coupling and Insert up to angle and place Female Coupling (1106010001) over O-Ring. Screw Coupling together. Tightening will complete seating of Needle Valve Adapter into neck of Vessel.

IV Assembly of 3 oz Vessel with Shield (1102070003):

- A. Slide Special Male Coupling (1107000001) over neck of Vessel.
NOTE: Make sure the thread with the inside chamfer (angle) is facing up.
- B. Spread open Polyethylene split-ring Insert (1107590001) and slip over neck of Vessel. Holding the Vessel and coupling upright by the coupling's knurled ring, place them into either end of the plastic shield body. Screw the bottom thread of the coupling all the way into the shield. Screw the plastic bottom all the way into the shield body.
- C. Complete assembly as described in Section I or Section III, depending on your application and the parts/accessories used.

NOTE: This shield will accommodate only the Standard 3 oz Vessel, not the Footed Vessel.

V Assembly of 6 oz and 12 oz Vessels with Shield (1102070006 and 1102070012):

- A. Drop plastic Shield Top over neck of Vessel.
- B. Slide Male Coupling (1106500001) over neck of Vessel.
- C. Spread open Polyethylene split-ring Insert (1107590001) and slip over neck of Vessel.
- D. Screw Male Coupling into Shield Top.
- E. Fit assembly into one end of the Shield Body, lining up the six threaded holes.
- F. Screw in Phillips head screws to secure Shield Top to Shield Body.
- G. Place Shield Bottom (plastic plate with drain holes) into other end of Shield Body lining up the six threaded holes.
- H. Screw in Phillips head screws to secure Shield Bottom to Shield Body.
- I. Complete assembly as described in Section I or Section III, depending on your application and the parts/accessories used.

NOTE: This shield is used for both the Standard and the Footed 6 and 12 oz Vessels. APPLICATION NOTE: There are alternate materials available for some of the component parts for such situations as higher temperatures or corrosive conditions.

Assembly Instructions for Lab-Crest Pressure Reaction Vessels

Please contact Customer Service at (856) 692-4435 or see our website www.astraglassinnov.com for more information.

SAFETY

Lab-Crest Pressure Reaction Vessels Clear Plastic Shield provides greater safety without obstructing view; holes in bottom permit air circulation or immersion in bath. The shield material is Acrylic. Its detection temperature is 99°C or 210°F.

A conservative rule of thumb regarding the relationship between pressure and temperature is that the pressure rating of the glass will degrade at the rate of 0.25psi per degree F rise above ambient temperature. (For example, with a 100 F rise, the rating of the 3oz vessel will drop to 200psi.) Astraglass Innovations has no specific temperature/pressure test data for these products, and we cannot warranty or guarantee any level of performance or fitness for any use.

Here are a few general ideas about safety when using glass under pressure. While glass is a strong material, it has characteristics that are much different from other strong materials. Minor surface imperfections can degrade the pressure ratings to a point of complete unpredictability. These include surface scratches, “hit marks”, abrasions, etc. Astraglass Innovations will not guarantee or warrant these products against explosion hazards. Adequate safety precautions include the safety coating we put on every bottle, shielding whenever the vessels are under pressure, and extreme care/caution in using the vessels.

Lab-Crest Pressure Reaction Vessels are supplied with a clear PVC coating to protect the outside from bumps, abrasions or nicks which may occur during use and storage. The coating will provide some cushioning against breakage if the vessel is dropped and contain the contents if broken. **NOTE: this coating will not contain contents if the vessel breaks under pressure. Please use adequate safety shielding when handling glass vessels under pressure.**

Pressure Reaction Vessels – Frequently Asked Questions

Q. What is the Lab-Crest Pressure Vessel used for?

A. The Lab-Crest Pressure Reaction Vessel offers the Chemist the opportunity to observe a variety of chemical reactions under pressure: Solubility of gases in liquids at different pressures and temperatures chemical reactions of liquids and gases as pressures and temperatures change effects of liquids or gases on metals the purity of propellant batches spray characteristics at different pressures.

Q. What are the available sizes?

A. The standard sizes are 3, 6 and 12 ounces. These sizes have been selected to fit the majority of sample-size requirements our users have. The vessels have a pvc outer coating for added protection in the lab. A permanent millimeter scale gives the researcher a standard reference for volumes. Custom sizes can be designed. Please contact us with your requirements.

Q. What pressures can I work with?

A. Glass is a very strong material and can withstand a range of pressures and temperatures. The Lab-Crest Pressure Reaction Vessels are made from heavy-wall Borosilicate tubing, selected to be without any flaws that would reduce the glass' capability to function under pressure. The thickness of the wall and the shape of the vessel contribute to the pressure rating for safe operation. The pressure ratings for the standard vessels are: 3-ounce vessel – 225psi
at ambient temperature 6-ounce vessel – 100psi at ambient temperature 12-ounce vessel – 75psi at ambient temperature

Q. What is the significance of temperature on the pressure rating?

A. All glass pressure ratings are calculated at ambient, or room temperature. As the temperature increases above ambient, there is a buildup of temperature differences, which reduces the glass' ability to withstand a given pressure level. A safe Rule-of-Thumb is to subtract .25psi from the rating for each degree F increase in temperature in the chemical reaction.

Q. What temperature is the safety coating rated to?

A. The safety coating is rated to 99°C / 210°F.