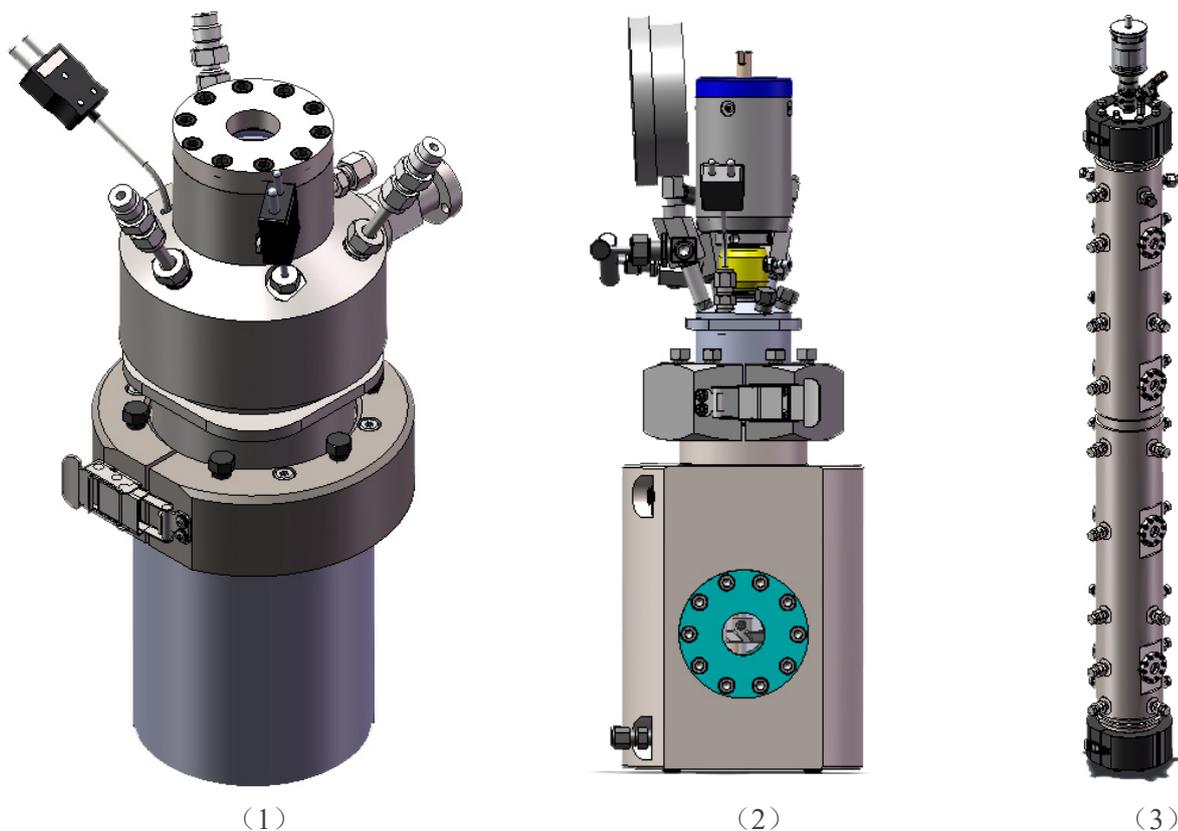


Parr 多用途视窗反应釜



- (1) Series 4600 1L Pressure Vessel with 1" integral sapphire window assembly 单窗光催化反应釜
(2) 4568 Reactor with two 1" integral sapphire window assemblies 对开双窗多用途反应釜
(3) Elongated 4554 20L Stirred Bioreactor with four pairs of 1" integral sapphire window assemblies
20L 加长对开 4 窗反应釜

We've listened to you! In response to a number of customer requests, Parr is pleased to offer larger windows installed in our pressure vessels for use at high pressure. Our [new 1" viewable round windows \(1 英寸观察圆形视窗\)](#) can be rated up to [1000psi/69bar at 225°C or 1500psi/103bar @ 25°C](#). Now you can **see more** of what is happening inside our pressure vessels.

These windows are made of [sapphire glass \(蓝宝石\)](#) and seal with an O-ring. See below for three examples of mounting geometry.

- The first includes a 1L pressure vessel with a window mounted on the head, to allow the user to perform photochemical activation. Note, that the head connections are relocated to the periphery of the head to accommodate the large window retainer.
- The second illustrates two windows installed in a typical geometry, that is, 180° apart on opposite sides of a cylinder, to allow light to enter from one side and the observer to view the vessel contents from the other side.
- The third shows four pairs of windows also located 180° apart. This geometry allow the customer to obtain video images of the contents of the vessel (a bacterial culture) at various heights, either near or far from the rotating impellers. In this case, the very low dead space

(0.25"/0.6cm between internal window face and internal cylinder surface) made this approach superior to welding flanges with windows to the outside of the cylinder.

- **Windows can be installed in Parr stirred reactors and pressure vessels** for visual observations, light transmission and other purposes. They usually are installed in pairs so that light can be introduced through one window while the other is used for viewing. Our standard material for these windows is fused silica. Sapphire is also available for small diameter windows. Alternative window materials (with coatings if requested) are available for specific transmission requirements. Windows can be mounted in several different ways.
- **More About Parr Window Reactor**
- **Screw-in Circular Windows**



The simplest window is a screw-in type with a 1/2" diameter viewing area. The windows in these assemblies are sealed in a fitting which screws into the vessel using a standard 1/2" NPT male pipe thread. Obviously, the vessel wall must be thick enough to provide full engagement for this thread. O-ring seals restrict the maximum operating temperature to 225 °C or less, depending upon the O-ring material. Alternatively, a Grafoil® gasket seal option is available to increase temperature

rating up to 350°C. Pressure ratings range from 1900 to 5000 psi, depending upon the window material and its thickness. Although these windows are rather small for straight optical viewing, they work well for small video systems and for laser and other analytical beams. A limitation of this design is that there is a dead space approximately 1.25" long between the inner face of the window and the inside wall of the vessel.

- **Integral Windows**



- **Round Integral Window**

- Parr has developed designs for installing windows in the wall of the vessel so that the inside face of the window is very close to the inside wall of the vessel. This eliminates the large dead space associated with screw-in windows. These windows are offered in the two styles described below. The maximum size of the window will depend on the size of the cylinder in which it will be installed.

- **Round Windows** with a 1/2" diameter viewing area are the standard. Round windows are available in a variety of materials including sapphire for very high pressures (up to 5000 psi). Both O-ring and Grafoil® seals are available in this

design. This type of window is generally used for visual, photographic or optical sensor observations.



- **Oblong Window**
- **Oblong Windows** with a viewing area 3.50” long and 0.62” wide are the standard size and can be installed on 4590/4790 vessels of 100 mL volume or 4560/4760 vessels of 450 mL volume and larger. Only O-ring seals are available in this design. Both Fused Silica and sapphire windows are available – maximum rating for these windows are limited to 1900 psi @ 225°C with FKM or FFKM seals. These windows are commonly used for visual observations of both the vapor and liquid phases or for observing the liquid level in the vessel. Multiple windows can be stacked on larger vessels.

• The windows described above as standard are maintained in our inventory for readily available replacements. Custom windows in both the round and oblong styles can be furnished in larger sizes upon request

- All reactors and pressure vessels equipped with windows require custom designed heaters and supports. Flexible heating mantles, integral cartridge heaters, and attached circulating jackets (600mL mini and larger) are the most commonly used heaters for window vessels.



- **Flange Mounted Larger Window**
- **Externally Welded/Flange Mounted Larger Windows**
- Large round windows that are either externally welded or flange mounted to the vessel can be installed. These will provide a **viewing area of 1 3/4” to 7 1/4”** depending on the size of the window ordered and the size of the vessel. Externally welded windows greatly reduce the maximum working pressure of the

vessel to 600 psi or less, although custom configurations rated higher are available.

• **Certification**

- The windows described above are considered “proprietary fittings” and as such are excluded from the scope of ASME Section VIII Division 1.
- Most of the standard windows furnished by Parr can be installed on vessels bearing the CE mark. The windows furnished on these vessels are subjected to various tests on a per lot basis in order to satisfy requirements of 2019/68/EU (Pressure Equipment Directive). Please contact Parr Instrument Company for further information.

As always, please contact us with requests for alternate window sizes or ratings. [Learn more about our windows](#) 如需特殊应用的视窗反应釜, 请联系我们 +86-10 82843682, Sales@eastsunland.com.cn Parr 为你量身定制。