

Solids/Slurry Addition Devices

One of the modifications most frequently requested is a port or other means to feed liquids, solids, or slurries into the vessel without removing the head. This can be done in various ways.

Solids Charging Port with Ball Valve

A ball valve with a 3/8" diameter opening can be installed on any one liter or larger vessel and used in conjunction with a high pressure pipette for injecting slurries under pressure. These are opened or closed with a quarter turn of the handle. Larger diameter valves are available for 1 gallon and larger vessels. These ball valves will withstand the full pressure developed in a reactor at moderate temperatures, but their pressure rating falls off rapidly at temperatures above 100 °C.



A143VB Ball Valve

Internal Catalyst Addition Device (ICAD)

Parr has developed a unique device for adding small amounts of solids (or liquids) from a sealed container held within a reactor. The ICAD is of particular interest to users performing kinetic studies of catalytic reactions. This device consists of a small cylindrical chamber with a cap that is sealed to the body with an O-ring. It attaches to the underside of the vessel head with a 1/8" NPT connection. To discharge the contents of the holder, gas pressure is applied through a valve installed on the top of the head. When the applied pressure is greater than the pressure within the reactor, the cap is forced open and the catalyst or other contents of the holder will be released into the reactor. This device works best in the taller, 450 mL and 600 mL Mini Reactors, and in the 1 liter and larger Parr Reactors.



A550HC Catalyst Addition Device

Solids Charging Ports

Part No.	Nominal Size	Orifice Diameter, in.
A143VB	1/4" NPT (F)	0.250
A132VB	3/8" NPT (F)	0.375
396VBAD	1/2" NPT (F)	0.406

Internal Catalyst Addition Devices

Complete Reactor	Mounting Size, cc	Assembly No.	Thread
Mini	6	A550HC3	1/8" NPT
One Liter	8	A550HC	1/8" NPT
Larger	20	A550HC2	1/8" NPT

Solids Charging Device

A solids charging device in the head of a reactor can serve as a convenient solids charging port at atmospheric pressure. The body of this device is machined with an internal taper to aid in the delivery of the solids into the vessel. It has a convenient screw cap closure with an FKM O-ring seal for use up to 225 °C. Other O-ring materials are available upon request, either for higher temperature operation or material compatibility.



Various views of Solids Charging Device with internal taper

Solids Charging Devices & External Catalyst Addition Device (XCAD)

Reactor	Available Fitting Sizes
Mini	1/4" NPT (M)
1 & 2 Liter	3/8" NPT (M)
Gallon & up	1/2", 3/4", & 1" NPT (M)

External Catalyst Addition Device (XCAD)

The addition of a specialized 5 mL or 10 mL chamber with a tools-free closure and two valves to the above solids charging device adds two important capabilities:

1. The chamber/valves assembly can be removed from the reactor without tools and filled in a glove box, for example, if an atmosphere-sensitive catalyst is being used.
2. Upon reattachment of the chamber/valves assembly to the reactor, a high pressure gas source can be connected to the top of the device to allow addition of catalyst to the reactor at elevated temperature and pressure.

Similar to the Internal Catalyst Addition Device (ICAD) shown above, the XCAD is ideal for kinetic studies, and is often paired with a gas burette ([page 126](#)) for constant pressure hydrogenation catalyst screening/characterization studies.

