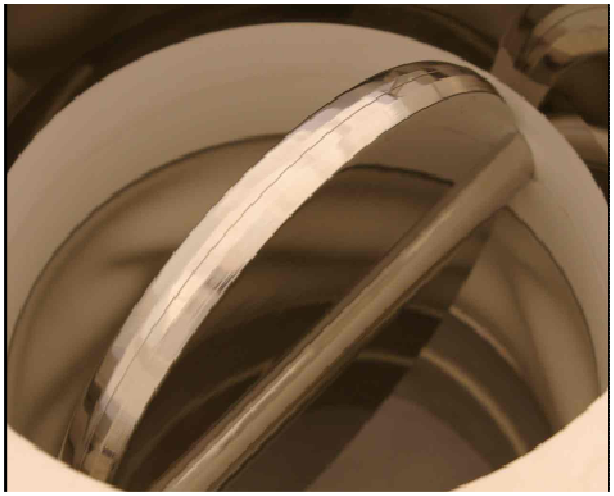
Technical Overview

ChargePoint Containment Valves Systems for Pressure and Vacuum Applications

HOW IT WORKS

The Active and Passive halves of the ChargePoint valve come together to form a metal-to-metal" disc seal. There are no gaskets, O-rings or inflatable seals necessary to create the seal between disc faces.



Thinner disc profile with metal-to-metal interface

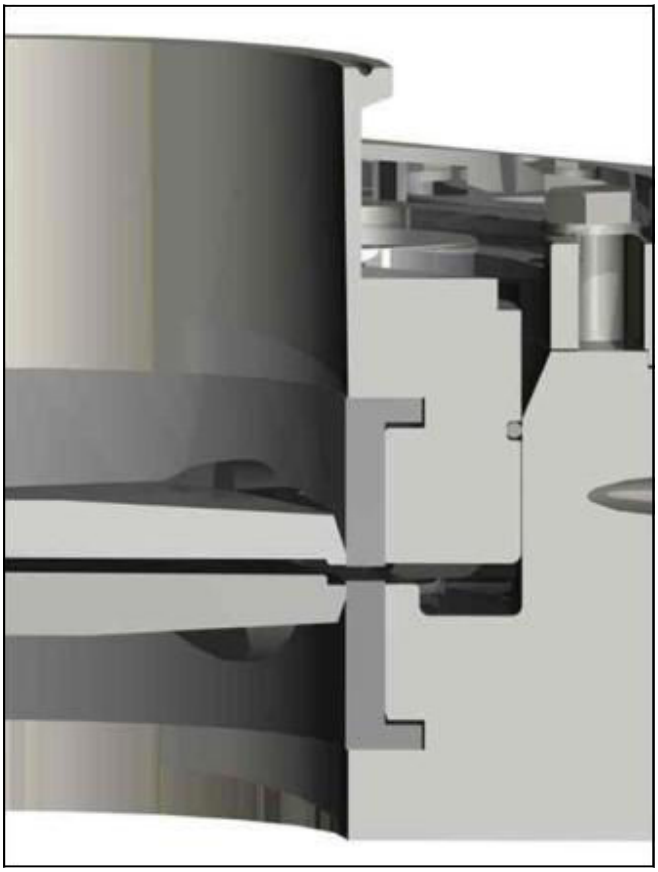
Where a gasket or o-ring is applied to form the seal between disc faces, this can introduce a potential void where product can migrate during transfer, which would effectively become exposed to the operator and environment when the Passive and Active are split.

Other potential disadvantages with having an elastomer seal between the disc faces, include the cost of seal replacement between campaigns and ensuring removal of particles beneath the sealing part .

ACHIEVING PRESSURE / VACUUM RATING WITH THE CHARGEPOINT VALVE

The methodology used to pressure rate the ChargePoint is unique to any other split butterfly valve. Where other technologies use the disc to pressure rate the valve, ChargePoint utilise a seal between the inner surface of the Active and the outer perimeter of the Passive body or pressure-sealing plug—see image below.

Pressure rated ChargePoint Passive with o-ring seal on the perimeter of the Passive



Pressure rated Passive being inserted into Active half and o-ring seal engaging into the inner bore of the Active body

When inserted into the Active half of the valve, the Pressure rated Passive or Pressure plug will maintain a 6Bar pressure or full vacuum seal.

The design adopted by other split valve manufacturers will use the Active valve disc as the pressure and vacuum sealing component. To achieve this, it is necessary to incorporate a thicker valve disc compared to that of a non-pressure rated version. This will successfully achieve the pressure rating whilst he valve is closed.

Pressure Rated Plug
with o-ring seal

Evident is the disc profile and a “curved” seat arrangement to enable the disc to rotate. This seat profile can also serve to increase the risk of bridging as product builds up on ths surface.

The initial disadvantage of this “thicker disc” version is apparent when transferring powder product through the valve. More noticeable on the smaller diameter valve ranged, typically 50mm and 100mm, the increase in disc thickness effectively reduces the cross sectional area available for product transfer.

As valve sizes increase from 150mm to 200mm, the disc restriction does not have as great an affect on the powder flow, however a further difficulty arises where the larger diameter disc presents increased friction between the edge of the disc and the mating seat. This resistance can be so great, that operating the pressure rated version of the 150mm and 200mm split butterfly valve, can only be achieved with the use of actuator assistance.

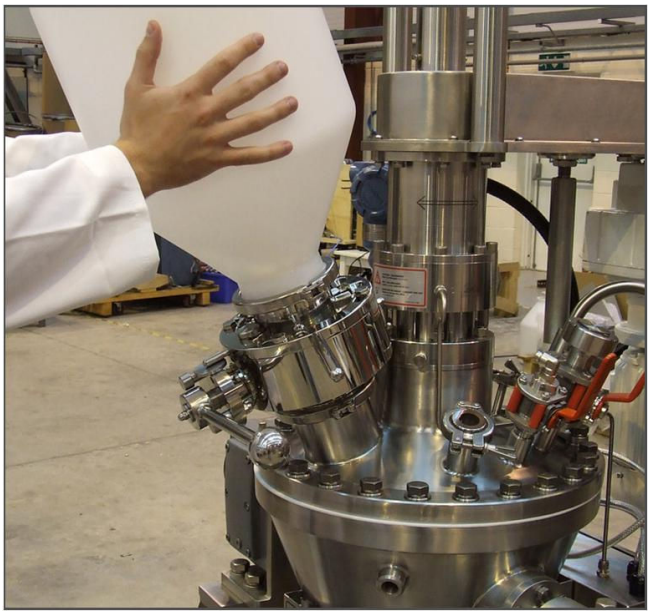
The ChargePoint pressure rated Active, maintains a common disc thickness for both non-pressure rated and pressure rated options. The cross sectional area available in both designs is identical. More so, he open / close operation on the larger diameter valves is no different between the two versions. For example, this benefits the specification of the pressure rated 150mm ChargePoint, which can be manually operated and does not require any form of pneumatic open / close actuation or operator control panel.

FURTHER ADVANTAGES OR THE PRESSURE / VACUUM RATED CHARGEPOINT

Since the pressure rated ChargePoint does not utilise the disc part to maintain the pressure / vacuum seal, it is possible to employ the valve for various applications which would otherwise not be possible with the conventional thicker disc sealing method.

A common Chargepoint application is that of reactor vessel charging. Adapting the technology of contained transfer using split butterfly valve onto an existing process vessel can occasionally require the sacrificing of a process connection otherwise being used for another operation. Regularly, in this instance, the sightglass port is replaced with the split butterfly valve unit. This then provides a means of contained charging and in the case of ChargePoint, as a result of its unique design method of achieving pressure / vacuum rating, the viewing facility can be removed.

Reactor vessel showing the ChargePoint installed and fitted with a pressure rated sightglass Passive (left) and pressure rated ChargeBottle Passive (right)



The Passive is tri-clamp connected to a pressure rated sightglass disc and the disc of the Passive maintains the containment and any contamination, which may have come into contact with the inner surface of the sightglass or Passive body.

Pressure rated sightglass Passive fitted into Active half with the valve open

The pressure rated sightglass Passive is designed to enable the valve to be opened and a pressure condition of up to 6Bar or full vacuum to be present.

This capability allows the vale to be used for additional applications that operate under these pressure or conditions.

Such processes include vacuum conveying, pressure transfer charging and recirculation cleaning applications.

ABOUT CHARGEPOINT TECHNOLOGY

ChargePoint Technology are market leaders in the supply of containment valves and integrated material handling equipment for the Pharmaceutical, Chemical, Food and other process based industries.

Our most important goals are to create lasting partnerships by providing high quality and reliable products, coupled with outstanding customer service.

As a pioneer of split valve technology our consultative approach will provide the right technological solution, as well as delivering the lowest cost of ownership benefits by maximising yield, reliability, productivity and flexibility.

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