OYSTER™ COMPOSITE VALVE

Scope:
The Oyster™ Composite Valve is the perfect choice for the discharge and accurate dosing by gravity of powder and granules, without risk of cross-contamination between product and outside environment.
The Oyster™ Composite valve is designed for use in the Pharmaceutical, Chemical and Food Processing industries.
The unique design of the Oyster™ Composite valve makes it ideal for the filling of drums, bins and containers where it is essential to control accurately the flow of product and achieve a target weight within a certain tolerance.

Key Features:
- Can be fitted with Bridge-breaker for use with less free flowing materials
- Offered with a choice of contact parts and seal materials
- The dosing ball can be customised to meet specific application requirements
- High quality pharma-finish (Ra < 0.4 internal)
- Range of actuation options
- Full range of connection options

All Oyster™ branded sanitary valves are designed according to cGMP standards. They are manufactured to exacting tolerances and finished to the highest pharmaceutical standard.

Application
Fine dosing

OYSTER™ COMPOSITE VALVE

Description:

The Oyster™ Composite Valve, so called because it is composed of two functional parts, combines:

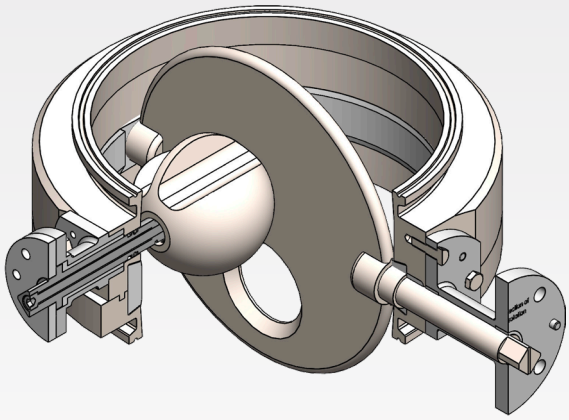
* **Main leaf** similar to a standard butterfly valve, which is opened and closed to achieve the bulk of the product discharge.

* **Dosing ball** which is inset into the main leaf, and discharges product through a hole machined there, and which is used to carry out the fine dosing of product in small quantities so as to achieve the target tolerance.

Both these components are independently controlled.

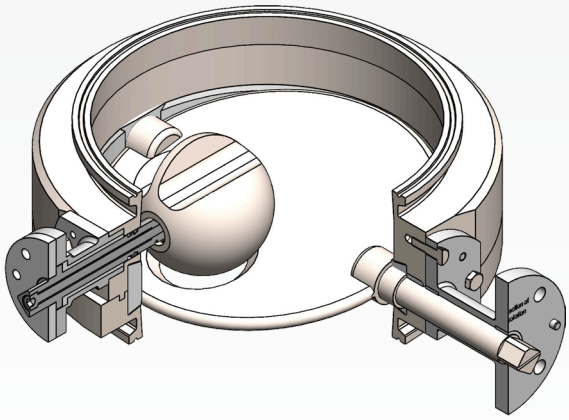
Operation and Control

The filling operation is achieved in three phases. These are:



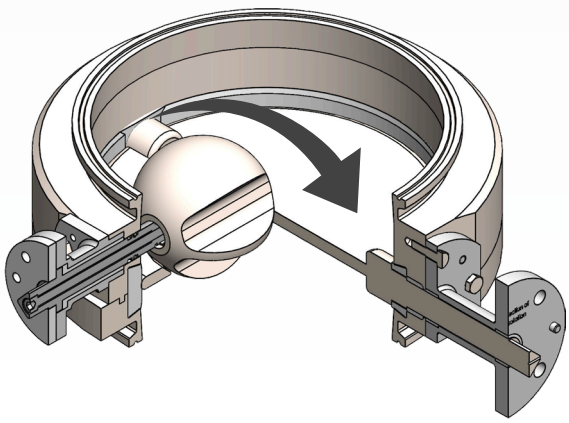
Phase 1

During the bulk discharge phase the main leaf is opened to the fully open position. Use of the 4-20mA positioner enables the valve to close proportionally as the discharged weight approaches the target.



Phase 2

As the leaf closes proportionally, at a certain point the product flow will stop, even though the valve is not completely closed. At this point product flow can be restarted by operating the fine dosing head while keeping the main leaf slightly open. This is particularly effective for the valve equipped with bridge-breaker. Phase 2 needs to be set up for each different product in such a way that at the end of phase 2 the amount of product remaining to be discharged is as little as possible. At the end of phase 2 the valve moves to the fully closed position.



Phase 3

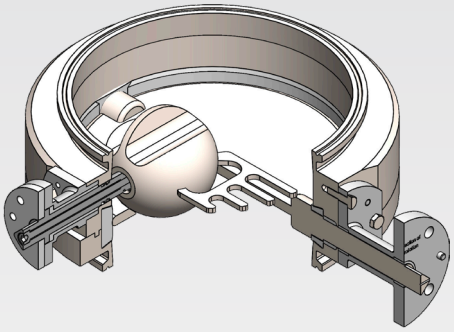
With the main leaf completely closed, the dosing head is brought again into operation rotating backwards and forwards 180°, with each rotation depositing a small amount of product until the target weight is achieved.

OYSTER™ COMPOSITE VALVE

Flexibility

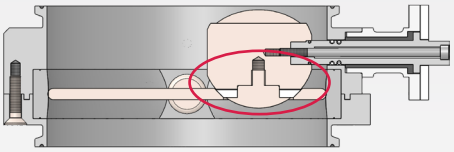
A significant advantage of the Oyster™ Composite valve and its unique dosing ball design, is that it can easily be customised to suit particular applications.

Unlike competitors' valves:



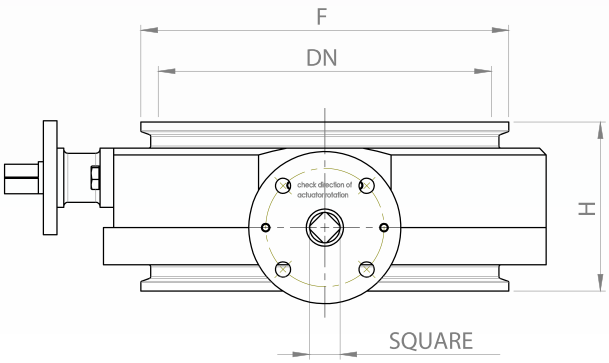
- Where the product being processed is not free flowing a bridgebreaker can be added to the dosing ball. This agitator moves as the ball moves and prevents the formation of a bridge above the dosing ball.

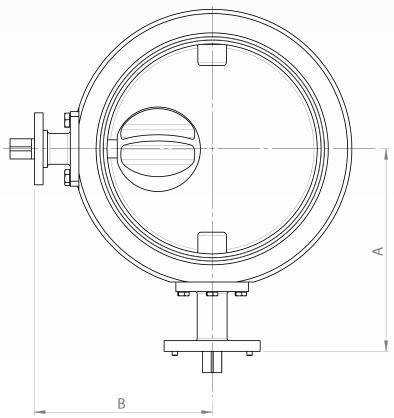
- Where a high degree of precision is required the dosing ball pocket capacity can be varied. Furthermore, it is a relatively quick and easy job to swap one dosing ball for another if required.



- For very fine free flowing product the valve can be provided with a seal between dosing ball and leaf to prevent leakage.

KEY DIMENSIONS:				
(Dimensions in mm)				
Nominal size DN	**150/65**	**200/80**	**250/80**	**300/80**
TC Connection F	6"	8"	10"	12"
Nom. Dosing ball diameter	65	80	80	80
A	165	190	215	240
B	157.5	166.5	207.5	232.5
H	95.5	100	100	100
Weight - Kg	11.8	16.5	20.1	24.0
* TC specification is ASME/BPE unless otherwise specified. A full range of tri-clover types can be supplied.				





OYSTER™ COMPOSITE VALVE

OPTIONS FOR OPERATION:	
Valve is supplied bare-shaft with ISO actuator mounting flanges F05 & F07. Drive square 14mm on both shafts.	
Recommended installation is with 4-20 mA positioner on main leaf to enable proportional operation linked to weigh station (not supplied).	
Valve automation:	Actuators, positioner and solenoid valves are supplied on request.
Air supply:	Min. 5bar (75 psi)/max 10bar (150psi). Dry and oil free.
ATEX:	Certification available on request: II 2GD cIIB T4/T135°C
OTHER OPTIONS:	
Bridgebreaker can be fitted to dosing ball for use with less free-flowing product [image supplied]	
Dosing ball can be customised to suit different product characteristics and application requirements.	

INSTALLATION ZONE:	
Working pressure	
In/Out	0.5 bar (7.3 psi)
Upstr./downstream*	N/a
Temperature	-20°/+80° C (-10°/176° F)
* On the standard valve there is a 0.5mm gap between dosing ball and the inside of the hole in the main leaf.	

All materials used in the construction of the Oyster™ Composite series valve are fully compliant with the requirements of the FDA, EN1935/2004 and cGMP. Product contact surfaces are mirror polished to the highest pharmaceutical standards.

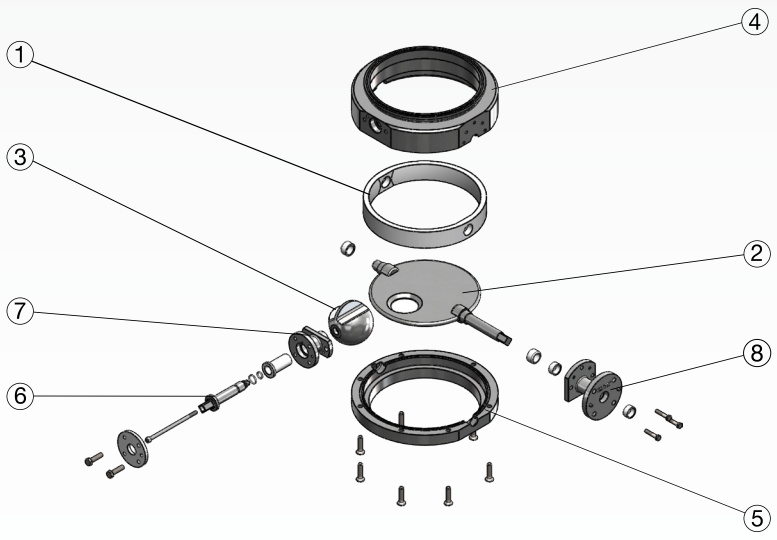


TABLE OF MATERIALS:		
Ref	**Part Name**	**Material options**
1	Gasket*	See table
2	Main leaf	AISI 316L, C-22
3	Dosing ball	AISI 316L, C-22
4	Upper H.body	AISI 316L, C-22
5	Lower H.body	AISI 316L, C-22
6	Dosing ball drive shaft	AISI 316L, C-22
7	Dosing ball actuator support	AISI 304
8	Main leaf actuator support	AISI 304
Not shown	Bushings	PTFE, PEEK, PTFE-anti static
Not shown	Shaft sealing o-rings	FFKM, Silicone, EPDM
* Material in compliance with FDA §177,2600		

OYSTER™ COMPOSITE VALVE

AVAILABILITY OF SEAL MATERIALS:				
	DN150	**DN200**	**DN250**	**DN300**
Silicone FDA, USP Class VI	YES	YES	YES	YES
EPDM White FDA	YES	YES	YES	YES
PTFE-Lined	YES	YES	YES	YES
FFKM	YES	YES	NO	NO

Notes on Optimising the control of the Oyster™ Composite Valve*:

Key points to note:

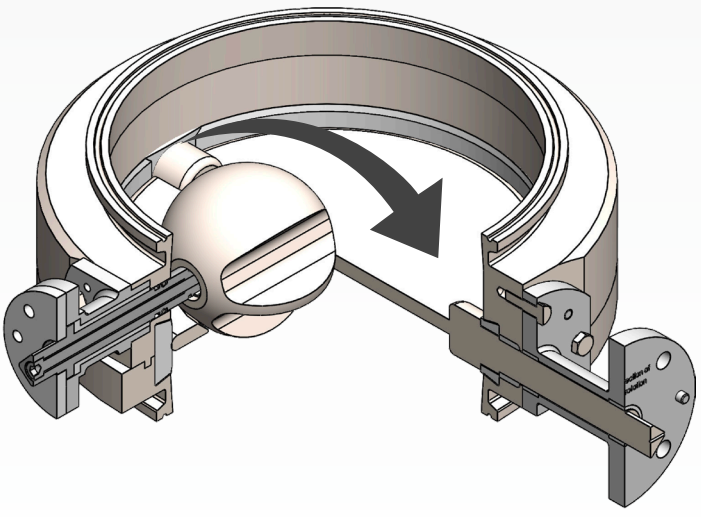
- Accurate dosing is slower than less accurate dosing. Time spent optimising the dosing control is fully repaid by time saved in future production.
- Every powder has different flow characteristics and will need different dosing parameters

The dosing operation should be divided into three phases:

1. Bulk discharge phase
2. Intermediate feed
3. Fine feed to target weight

The bulk discharge phase uses a 4-20mA positioner on the main flap to open the valve 100% for the initial stages of the operation. If the control system allows it, as the weight approaches the cut-off for the next phase, the valve progressively closes. Alternatively for each type of powder it is possible to establish one or two opened positions to give a fast and a slower discharge rate. This is the fastest material flow rate and so by discharging the maximum amount of material possible in this mode will help to minimise the overall time to complete the fill. Speed and timing of closing during this phase are key parameters.

As the valve progressively closes, at a certain point, which will vary from product to product, and will be necessary to establish for each type of powder and record as another key parameter, which we can call the choke point, the product flow will stop. With the main flap at the choke point, activate the dosing head. The rotation of the dosing head backwards and forwards 180° will act as an agitator and cause product flow to recommence but at a slower rate than before. This is the Intermediate feed . The addition of the optional bridgebreaker to the dosing head will greatly improve the efficiency of this phase.



The Fine feed takes place with the main flap fully closed and the dosing head rotating backwards and forwards discharging very small quantities of product each time. This is quite slow, typically 20-30g per cycle and so it is desirable to minimise the amount of material discharged during this phase, hence the importance of setting the imtermediate feed as accurately as possible for each type of powder so as to get as close as possible to the target before activating the fine feed.

At all stages of the process, due account must be taken of the in-flight weight which will vary during each phase.

*With thanks to Powcon Ltd, Ireland.

OYSTER™ COMPOSITE VALVE

Besides the Oyster™ Composite valves, ValvEngineering offers a complete range of hygienic valves and dosing valves for powders, and sampling systems for both solids and liquids. All of our products include outstanding design features and superior manufacturing quality which make them ideally suited to the demanding requirements of the pharmaceutical, Food & Beverage and Chemical Industries.

On this page is a brief introduction to our key products. Please do not hesitate to contact us for further information about the products or to discuss specific applications

Oyster™ Compact Series

The Oyster™ Compact series features the patent Clamshell clamp system, widely acknowledged as the most compact, hygienic and user-friendly valve on the market.

Oyster™ Lumpbreaker

The Oyster™ Hygienic In-line Lumpbreaker is the ideal solution for breaking up lumps that can form in bulk powders and other solid products during storage or transport.

Oyster™ Feeder Valve

Metal/Metal construction makes the valve suitable for continuous operation by motor for large discharge volumes. Shaped valve body ensures control of product flow.

Oyster™ Samplemaster

The Oyster™ Samplemaster includes both intrusive and non-intrusive sampling valves for powders and granules. They are offered in both manual and automatic versions, with a vast range of mounting options and configurations.

Oyster™ Reactor Sampling System

The Oyster™ Reactor Sampling System is a safe and reliable sampling device able to meet the most demanding requirements of the pharmaceutical and chemical industry.

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