

The design of a butterfly valve

Butterfly valves are extremely important to many processes within the pharmaceutical, chemical, wastewater and food industries. They work to either isolate or regulate product flow within the process. In this PDF, we will be discussing the design of a butterfly valve and outlining the difference between split body and solid body butterfly valves.

Butterfly valve specification

Butterfly valves usually feature a disc, body, seat and stem. All of these elements work together to restrict or completely shut off flow. Butterfly valves are either centric or eccentric. Centric butterfly valves have a stem that is located in the middle of the disc and the disc is centred in the bore. However, with an eccentric butterfly valve there is more than one stem that is offset from the centre according to the classes of single, double and triple offset valves.

Butterfly valve working principle

A butterfly valve's working principle is similar to that of a ball valve, which allows for quick shut off. Butterfly valves hail from the quarter-turn valve family. When the disc is rotated a quarter turn, the valve is either fully open or closed. The so-called "butterfly" is a metal disc mounted on a rod and when the valve is closed, the disc is turned such that it completely blocks the passageway. Fully opened, the disc is rotated a quarter turn to allow a near unrestricted passage of the fluid. It can also be opened incrementally to throttle flow.

Split body Vs solid body butterfly valves

Industrial butterfly valves are usually available with two different body styles: solid body or split-body. A split-body valve offers some benefits over a solid body, especially if the seat material is PTFE which is very rigid. The design of the butterfly valve allows it to be disassembled and have the seat changed without the need for special tools to compress the seat into the body. It also means that parts can be recycled, whereas a solid body valve would generally be completely changed out if the seat was worn/damaged.

Having a split body also allows for a one-piece disc/stem, which inherently has a thinner profile than two-piece disc/stem, giving much greater flow capacity (Kv). The one-piece disc-stem also minimises torque and eliminates any possible slack that might occur with separate disc and stem.

Solid body valves, however, are generally much easier and cheaper to produce which makes them the more economical choice.

Butterfly valves from BM Engineering

Unitech

Based in Genoa, Italy, Unitech SRL are a leading supplier of high quality manufactured valves and products for the process industry. Unitech's products are produced to 97/23/EC 'PED' and 94/9/EC 'ATEX' in compliance with ISO 9001:2008 standards. Our long-standing partnership means that we can consistently supply quality products from a partner you can trust.

Unitech's range includes:

- Steel body valves
- Ductile iron body valves
- Wafer pattern valves
- Lugged pattern valves
- Split body valves
- Damper valves
- Eccentric stem valves
- ATEX valves

Zwick Armaturen

Zwick Armaturen has 30 years' experience in designing and manufacturing valves of the highest standard. Their triple-offset butterfly valves are used in industries such as oil and gas, chemical, petrochemical, energy, offshore and steel – where critical applications require reliable functionality and 100 per cent zero-leakage.

Zwick's range includes:

- Triple-offset wafer butterfly valves
- Triple-offset lugged butterfly valves
- Triple-offset double block and bleed valves

To find out more about the butterfly valves working principle or to purchase a butterfly valve from BM Engineering, get in touch today on **0141 762 0657** or email sales@bmengineering.co.uk.