

Conventional Swing Check Valves

VS

Dual Plate Check Valve

Selection of right type of pump discharge non - return valve is very important for effective & trouble - free functioning of the pumping machinery in the long run. Off late we have experienced proposals for installing Spring Loaded Dual Plate Check Valves with the plea that it occupies less space

Wafer - Type Check Valve

Refining Department

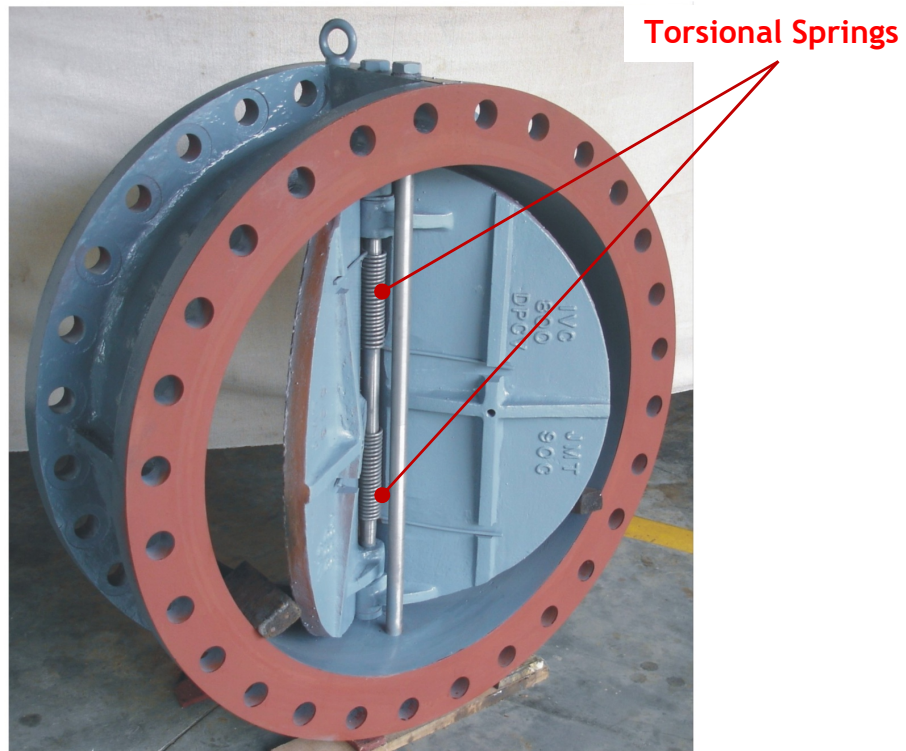
API STANDARD 594

Dual Plate - consists of two semi - circular plates that are spring loaded to assist the closing of the valve when line back pressure or flow reversal forces the plates against the valve body seats

(The above is an abstract from the standard itself)

CONSIDER THE FOLLOWING:

- 1) There is an American Water Works Standard for check valves (ANSI/AWWA C 508) which has co-existed with the API std for more than 40 years now, implying for water works application, they still prefer the single or multi - door full bodied check valve for water works.
- 2) Our national standard of water works for non-return valve (IS 5312 Part I & II) does not cover dual plate design.
- 3) The dual plate check valve requires internal torsional springs for door closure.



Once the spring loses its rigidity, the operation becomes lethargic (like in a door closure); no adjustment is possible. This could lead to undesirable surges.

Result could be catastrophic calling for frequent repairs (requiring plant shut down) and / or replacements -

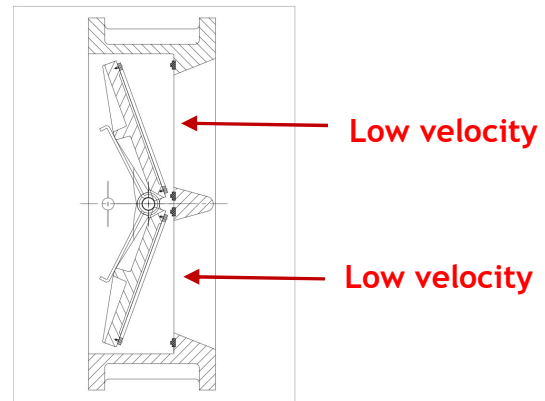


Spring failure

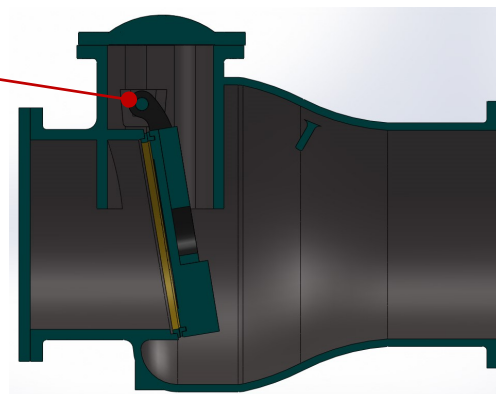
- 4) The API standard is by the refining department of the American Petroleum Institute and is probably meant for application where the fluid is crude oil / petroleum. One can't be too sure about springs lasting long in water (pH is never 7.0) especially water having high turbidity as in case of lift irrigation.



- 5) Due to the constant pressure exerted by the springs the plates tends to remain in partially closed position particularly so where the velocity is not very high as in most of the water works. This results in very high head loss thereby reducing efficiency of the pumping system.



In case of swing check valve the door swings freely, the arms being swung from a trunnion above, the extent of swing away from the body seat governed by flow velocity. Similarly the closure is gravity assisted, the door beginning to close with deceleration of water on pump. More over the hydraulic passage around the door is much larger than the pipe bore resulting in slowing down of the return flow resulting in little or no slam and lower head loss.



- 6) In view of long time maintenance free service dual plate check valve is way behind the conventional swing check valve. Conventional swing check valve is virtually maintenance free having no complicated arrangement inside the valve chamber. Whereas dual plate check valves have got complex fixing arrangement including the springs which needs regular care. Apart from this the resilient seat on the body has got a very limited life and can only be replaced after removing the valve from the pipe line & sent to vulcanizing shop having the right sized die.

In view of this a good design of a **SWING** check valve (recoil type single door / multi-door) is a desirable option.