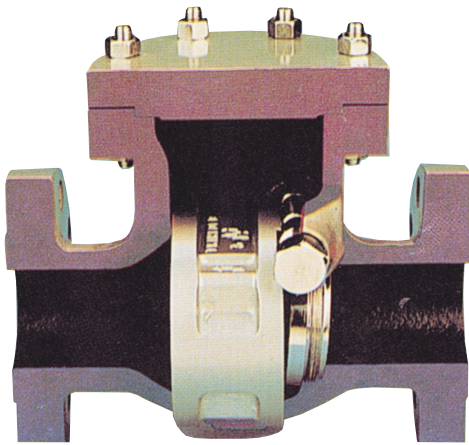


Advantages of Velan-Proquip Check Valves over Conventional Swing Checks



REDUCED SIZE - WEIGHT - COST:

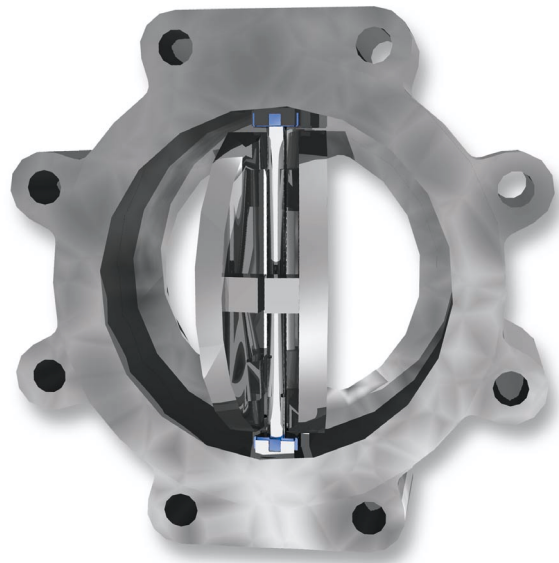
The inherent design of the double flapper check valves results in a significantly reduced weight as compared to the conventional full bodied check valve. As the valves increase in size the **Velan-Proquip** valve will be as little as one fifth the weight of the full bodied unit. This results in savings in initial cost, space, and pipe support element installation.

REDUCED LINE SHOCK:

To minimize/eliminate line shock, check valves must close as quickly as possible prior to the flow having an opportunity to reverse. As each of the flappers in the **Velan-Proquip** check valve is only half the size of that of a full bodied check, they experience reduced fluid drag and can move more quickly to the closed position. Their swing radius is one half that of the conventional check valves. The leading edge distance from open to closed position is halved, in turn reducing the travel time by 50%.

The reduced weight of a dual disc valve flapper versus the full bodied swing check is a major factor in minimizing water hammer. The heavier full bodied disc has greater momentum when swinging closed, causing it to slam into the valve seat resulting in severe damage, (in large valve sizes the disc can weigh up to a ton).

For potentially severe applications, **Velan-Proquip** offers a high torsion spring to ensure the valve closes as quickly as possible.



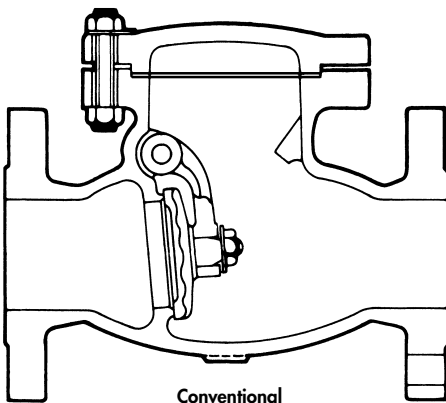
LOWER PRESSURE DROP - REDUCED ENERGY COSTS:

The two factors that affect pressure drop across any valve are:

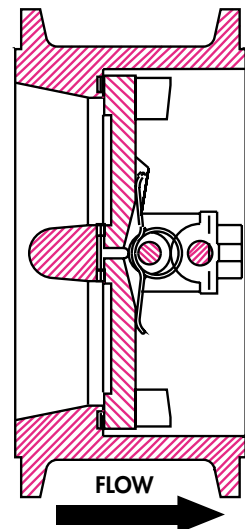
- 1) The unobstructed flow area.
- 2) The energy required to maintain the valve in the open position.

Specifically, full-bodied swing check valves have a disc which is hinged at the top with gravity working to keep it in the closed position. Flow must provide sufficient energy to overcome this force of gravity and lift the disc. This energy requirement increases dramatically in larger sizes.

Velan-Proquip valves are installed such that the flappers are hinged at their sides like a door. Thus, the effect of gravity is eliminated. Consequently, very little energy is needed to open the valve and maintain this position, resulting in lower energy costs.



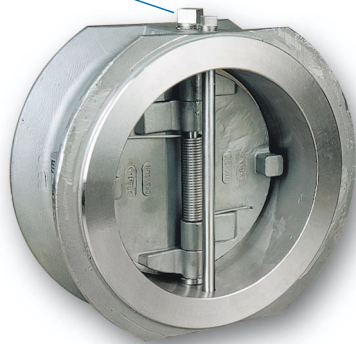
Conventional
Swing Check Valve



Velan-Proquip
Check Valve

Features of Velan-Proquip Wafer Style Twin Flapper Valves

Pin Retainers



Conventional Design

RETAINERLESS BODY DESIGN:

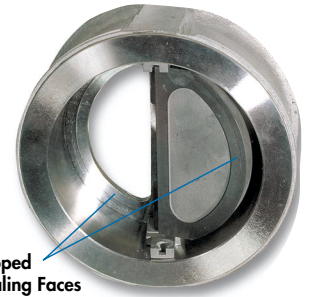
With growing concern over fugitive emissions, and potential environmental implications, **Velan-Proquip** has standardized on a retainerless, fugitive emission design. Alternate designs incorporating threaded or, threaded/seal welded pipe plug retainers have potential for leakage due to improper field assembly or corrosion at their threads.



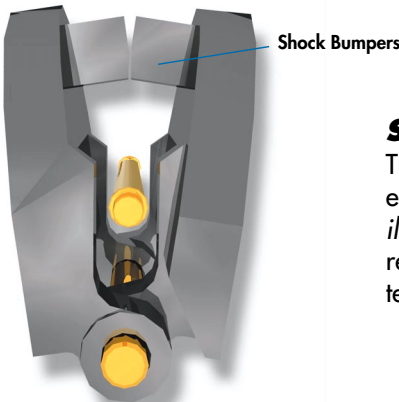
Retainerless
Velan-Proquip design

LAPPED BODY/FLAPPER SEATS:

The heart of each valve is the seat/seal interface. **Velan-Proquip** utilizes the most updated machining methods and equipment to achieve maximum flatness with a fine lapped finish. The end result being product that easily meets and exceeds test requirements of API 598 for metal seated check valves.



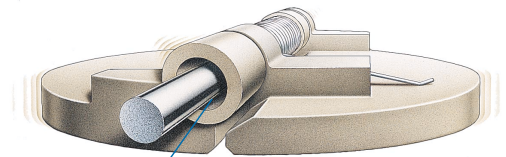
Lapped
Sealing Faces



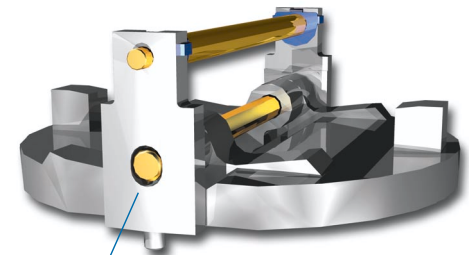
Shock Bumpers

SHOCK BUMPERS:

The **Velan-Proquip** design utilizes heavy duty "shock bumpers" on the back of each flapper. These bumpers meet when the valve is in the full open position (see illustration) thus preventing the flappers from striking the stop pin. This arrangement reduces the shock force on the hinges, ensuring internal components have an extended cycle life with minimal wear under the most severe service conditions.



Clearance causes rattling (competitor's design).

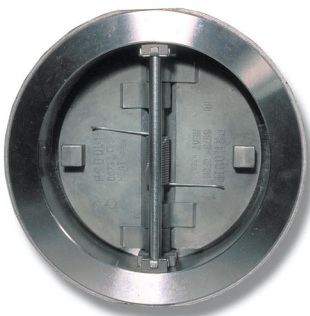


Slot permits movement in direction of flow only (no rattling).

SUPERIOR HINGE DESIGN:

In order to eliminate seat wear during the opening cycle, all dual plate check valves incorporate clearance between the hinge pin and body bearings, or hinge pin and flapper bore. This allows the plate assembly to lift off the seat prior to flapper rotation preventing the heel of each flapper from scraping across the body seat. Competitive products have an oversize bore in the flappers or bearings. This weakness in the form of added clearance permits the flappers to move side to side allowing constant rattling 24 hours a day, leading to premature failure.

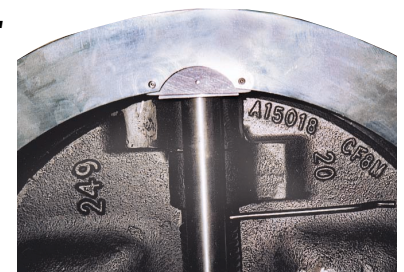
Velan-Proquip features a slot for the hinge pin, allowing it to move only in one axis. Flappers last longer and the useful life of the valve is extended, (covered by US patents 5246032, 5381, and other patents globally).



Velan-Proquip design

BODY WITH UNINTERRUPTED GASKET SURFACE:

Other retainerless designs have an internal retention method incorporating a special key and retaining screws. These components encroach on the serrated sealing face area and as well the screws can corrode making maintenance difficult. **Velan-Proquip** utilizes an internal retention method which does not encroach on the gasket sealing surface.



Competitor's retainerless design