FLEXIBLE WEDGE GATE VALVES

The Velan flexible wedge, with round geometry and stem low in the cavity, was pioneered by Velan in 1960. It has a large flexibility index (up to 0.035" or 0.89 mm) within normal closing torques and allowable stresses to compensate for seat distortions caused by piping loads, thermal and pressure fluctuations, seal-welding of seats and cooling down of a valve closed hot. The major difference between a Velan flexible wedge valve and a parallel slide valve is the high wedging force acting on the seats, which adds to the primary fluid pressure force, resulting in superior tightness of seats and freedom from sticking. In addition, the wedge guiding minimizes seat rubbing and scuffing as seats are contacted only at the last 5% of total travel, resulting in long cycle life.

1. **Low stem head** in wedge cavity reduces height and weight of valve. *Design pioneered by Velan.*

2. **Tight guiding system.** For austenitic stainless and for high-temperature service, hardfaced wedge grooves are precision-guided in welded-in machined guides.

3. **Seat rings** are long to compensate for temperature fluctuations and are seal-welded. Seating faces are hardfaced with Stellite 6, ground and lapped to mirror finish.

ADVANCED PARALLEL SLIDE GATE VALVES

Velan manufactures one of the world’s most advanced forged parallel slide valves. Our unique cage unit comprises all of the operating parts of the slide discs. The parallel slide valve design relies on the primary system pressure acting on the downstream disc for seat integrity. There is no wedging action or extra loading on the seats. As a result, closing torques are considerably lower, requiring less manual operating effort or smaller power actuators. Due to its inherent design, the parallel slide valve is not subject to thermal binding concerns, resulting in a distinct safety advantage in high temperature service. Thermal binding may result in some applications utilizing wedge type gate valves when operating conditions begin to approach 900°F. In these instances, a compression load (due to thermal expansion) in addition to that initially applied for closure results. This additional load may cause the valve to bind, even to the point of restricting opening.

The inherent disadvantage to parallel slide valves is seat wear due to seat loading throughout the entire travel. This effect has been minimized in the Velan design by using wide Stellite 6 hardfaced seating surfaces, a centralized Inconel spring (which distributes part of the load on both seats as well as compensating for seat wear), and a precision guiding system which eliminates vibration. Bypass valves are recommended to equalize pressure across the disc before opening if the valve is exposed to very high differential pressure.

**Forged Cage Unit**

Two slide discs with large hardfaced seating faces are contained in the disc carrier and are in contact with a cantilevered Inconel spring. A plate holds all parts together forming the cage unit. A precision machined guide fits into the carrier slot and provides close guiding during the entire travel. The use of the cage construction considerably reduces the weight and size of the Velan design compared to commonly used parallel slide valves with the “kangaroo pocket” in the bottom of the valves.
Body Guided Disc Eliminates Side Thrust
The forged disc has an integral Stellite hardfaced seat and guide surface. It is guided at the top and bottom. This assures perfect seat and disc alignment in spite of the side thrust caused by high flow velocities and pressure differentials. This protects the stem from bending, scoring and galling and provides longer disc, seat and body life.

Integral Stellite Seat
The integral Stellite hardfaced seat provides maximum resistance to erosion and wear under high flow velocities and distortion due to extreme temperature changes and piping loads.

Stop Check Valve
Available with equalizer pipe for steam service or with equalizer pipe and piston rings for very low flow applications.

Low Friction Stroking
- **Top and bottom-guided disc** assures stem operation without side thrust caused by high pressure flow.
- **Stem is non-rotating**, resulting in lower friction of all moving parts and longer stem packing life.
- **Impactor handwheel** gives 3–10 times more closing force than a standard handwheel. All this resulting in smooth, easy operation and tight shutoff under extreme pressures.

Easy Repairs In-line
The entire seat area is visible, so quick repairs in-line can be made after removal of the bonnet assembly. Minor seat damage can be removed by lapping, and major damage can be repaired with portable boring tools. The pressure seal area can also be refinished with a simple honing tool.

Y-Pattern
Globe, stop, globe stop check and piston check valves are also available in Y-pattern style (see pages 32 and 33).