

Pinnacle Series Safety Valves

APPLICATIONS

- Ultrahigh-pressure completions
- Sweet to severely corrosive environments
- Temperatures from 40 degF to 400 degF [4 degC to 204 degC]

BENEFITS

- Meets a wide range of specific applications.
- Provides increased reliability and long life in hostile environments.
- Has proven, durable piston design.
- Is cost effective and easy to run.
- Allows fewer potential leak paths.

FEATURES

- Choice of premium materials and design options
- Reliable nose seal technology and full metal-to-metal sealing Inconel® flapper mechanism
- Metal and nonelastomeric sealing technologies, combined with a precision piston tube and metal-to-metal up- and downstops
- Metal-seal body joints and a minimum number of seals
- Autoclave high-pressure control line fittings (thread and cone), with 0.065-in [1.7-mm] wall thickness control line

Severe service, premium rod piston, metal-seal body joints, flapper-type valve with working pressures to 20,000 psi [137,895 kPa]

Pinnacle* safety valves are a high-quality, cost-effective solution to high-pressure completion requirements. These valves incorporate the latest material and technological advancements resulting from years of experience and leadership in high-pressure valve design. Pinnacle 20,000-psi [137,895-kPa] valves are API Class 2 sandy service certified (also designed in accordance with ISO) and are engineered to provide a compact, reliable, and affordable solution to emergency well protection.

The rugged and proven Pinnacle design includes a rod piston mounted in a precision piston tube with dual dynamic metal-to-metal elements and spring-energized, graphite-filled Teflon® sealing elements. It also includes metal-to-metal up- and down-stop static seals and a compact flow tube nose seal. Pinnacle valves also feature a rugged Camco* flapper-closure system, Cam-P* body joints, and a reliable lockout mechanism, with or without hydraulic communication, for a secondary valve.

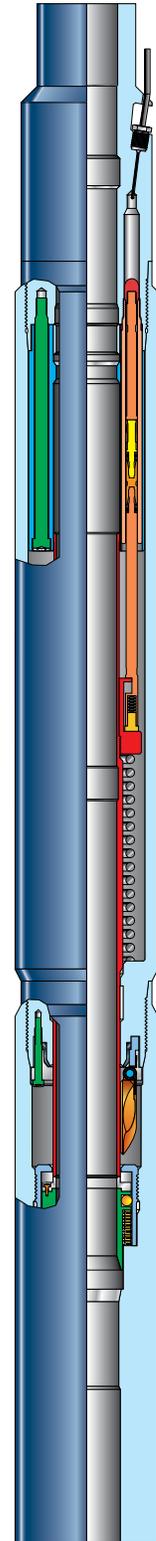
These valves are designed to provide easy serviceability and dependable flapper lock open, with or without hydraulic control fluid communication. Pinnacle valves are available with working pressures to 20,000 psi [137,895 kPa] and setting depths to 5,000 ft [1,524 m].

APPLICATIONS

Pinnacle safety valves are designed for severely corrosive environments to 400 degF [204 degC]. Schlumberger manufactures safety valve components from materials with proven performance characteristics in the most hostile conditions. Schlumberger can also provide a special ScaleGard* coating to minimize the accumulation of solids on the internal surfaces of the valve. This coating is especially effective where severe scaling occurs, particularly in hostile environments with high temperatures.

VALVE OPERATION

To equalize Pinnacle safety valves, pressure is applied to the tubing above the valve until the pressure equalizes across the flapper. After equalization, the valve is opened by applying the required pressure to the hydraulic control line. To close the valves, the hydraulic control line pressure is released.



Pinnacle safety valve.

Pinnacle Series Safety Valves

LOCKOUT OPERATION

To permanently lock open a Pinnacle safety valve, a designated lockout tool is used to deform the flow tube assembly. The flapper is held open in a recessed area of the flapper seat as the result of these deformations. To initiate hydraulic communication, a lockout sleeve is shifted downward in a simple, one-trip, slickline operation. This downward movement parts the shear plug and establishes hydraulic communication to the valve ID. A secondary valve can then be installed in the Pinnacle valve using standard slickline operations. Secondary valve and lock assemblies are available from Schlumberger.

Engineering Data for Pinnacle Series Safety Valves

Tube Size [†] (in [mm])	Valve Type	Max. OD (in [mm])	Nipple Bore (in [mm])	Working Pressure (psi [kPa])	Tensile Strength [‡] (lbf [kg])
2.875 [73.0]	Pinnacle 15	5.250 [133.4]	2.312 [58.7]	15,000 [103,425]	622,471 [282,290.5]
3.500 [88.9]		5.708 [145.0]	2.562 [65.1]		667,636 [302,772.9]
4.500 [114.3]		7.875 [200.0]	3.562 [90.5]		1,242,095 [563,290.0]
4.500 [114.3]	Pinnacle 20	7.137 [181.3]	3.250 [82.6]	20,000 [137,895]	1,141,300 [517,579.0]
5.500 [139.7]	Pinnacle II 15	8.577 [217.9]	4.312 [109.5]	15,000 [103,425]	1,321,885 [599,474.6]

[†] The engineering data provided illustrate the scope of this product offering but are not all inclusive. Additional sizes and pressure ratings are available upon request.

[‡] Tensile ratings are given for specific example valves; higher-strength materials affect this value. Tensile ratings shown are exclusive of end connection (EOEC) and at ambient temperature.

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