

# VALVES

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By:  
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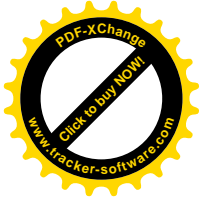
# Valves

- VALVES are the manual or automatic fluid-controlling elements in a piping system. They are constructed to withstand a specific range of temperature, pressure, corrosion, and mechanical stress. The designers select and specifies the proper valve for the application to give the best service for the economic requirements.
- Valves have some of the following primary functions:
  - Starting, stopping, and directing flow
  - Regulating, controlling, or throttling flow
  - Preventing backflow
  - Relieving or regulating pressure



# Types of Valves

- Gate valves
- Ball Valves
- Butterfly Valves
- Globe Valves
- Plug valves
- Solenoid Valves

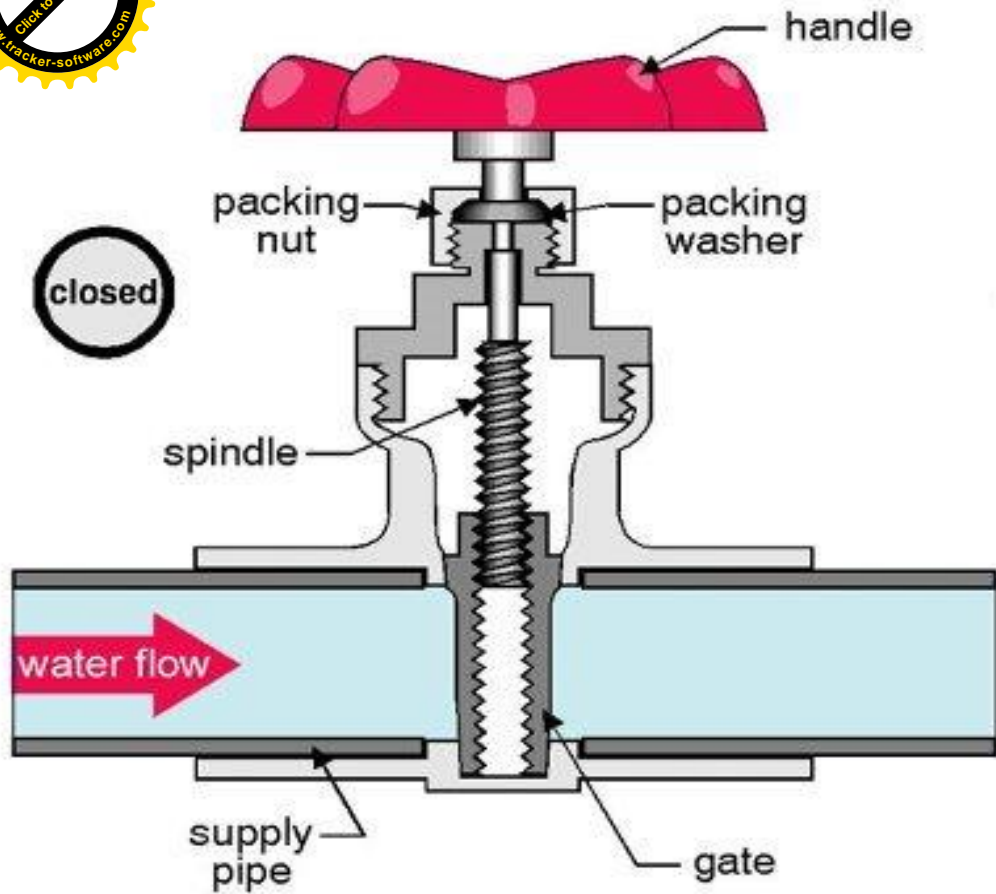


# Gate Valves

- Gate Valves are designed to operate fully open or fully closed. Because they operate slowly they prevent fluid hammer, which is detrimental to piping systems. There is very little pressure loss through a gate valve. In the fully closed position, gate valves provide a positive seal under pressure. However, under very low pressure, i.e. 5 psi, light seepage would not be considered abnormal with this kind of valve.

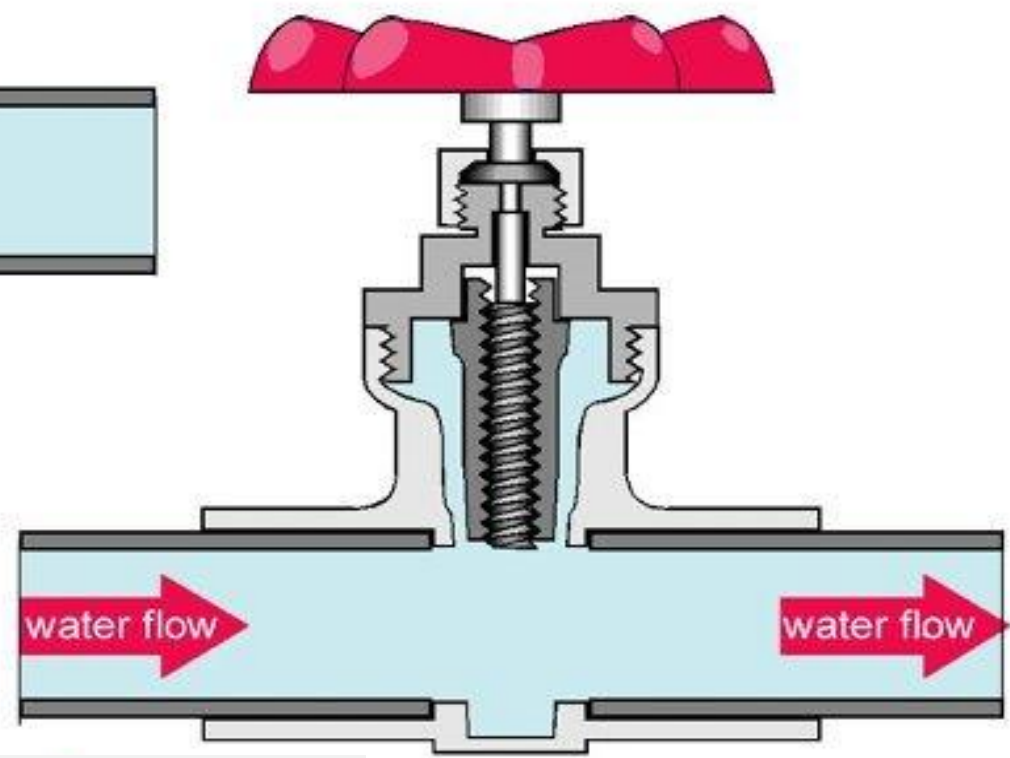


# Gate valve



gate valves are meant to be fully open or fully closed  
since the seal is metal-to-metal, corrosion can cause these valves to fail

open



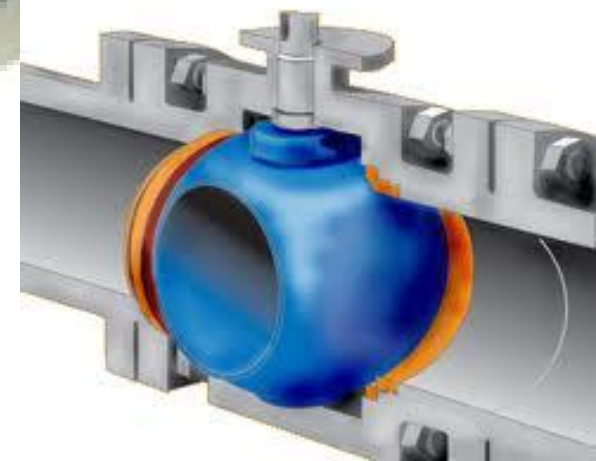
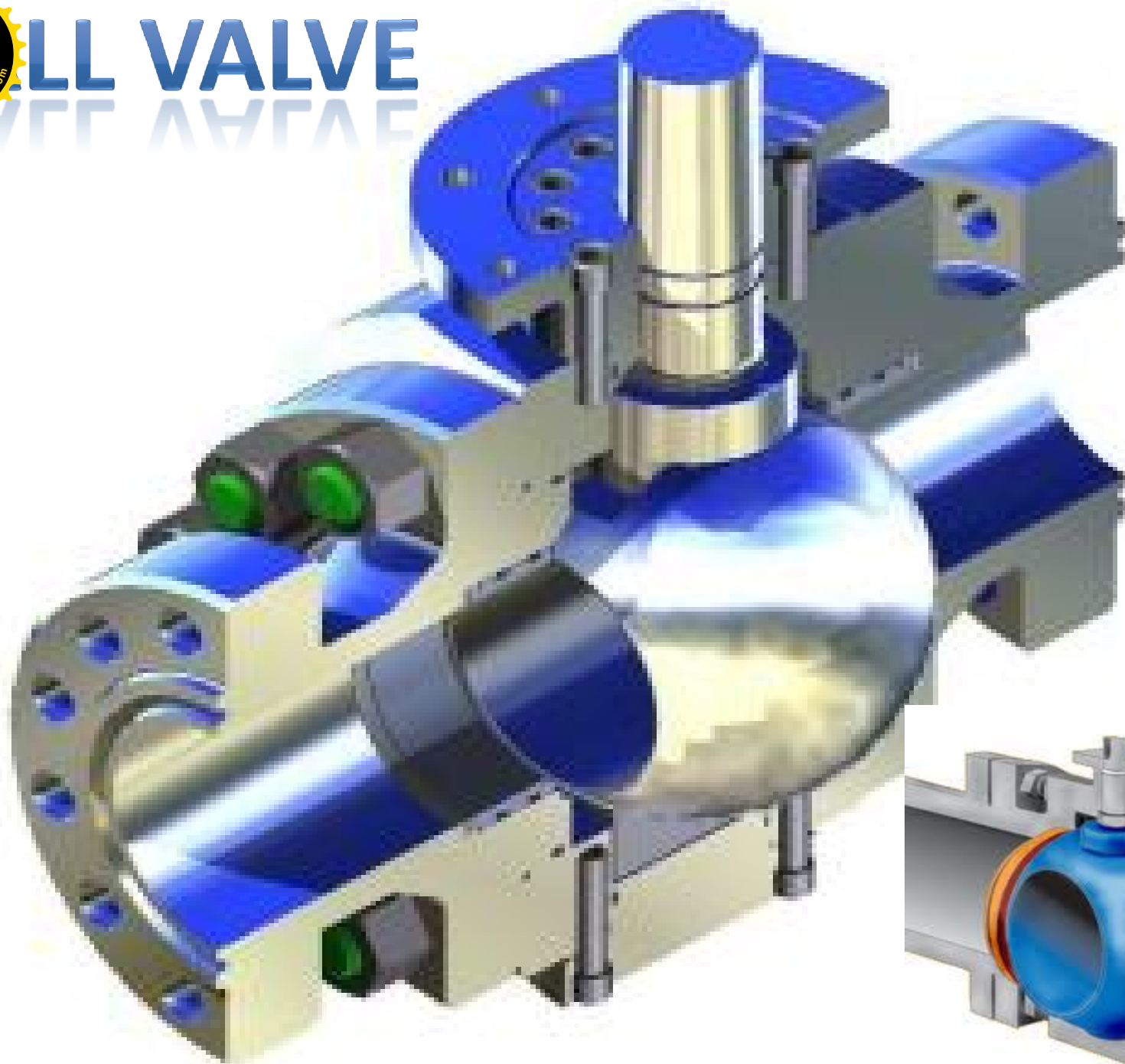


# Ball Valves

- Ball Valves are also designed to be operated fully open or fully closed with any liquid containing particles that could scratch the ball. Many people use them successfully for throttling clear water. Ball valves have low pressure drops, open and close quickly, are simple, and are trouble free. With the development of Teflon seals, ball valves have grown in popularity. Opening or close in a ball valve too quickly can cause fluid hammer.



# BALL VALVE





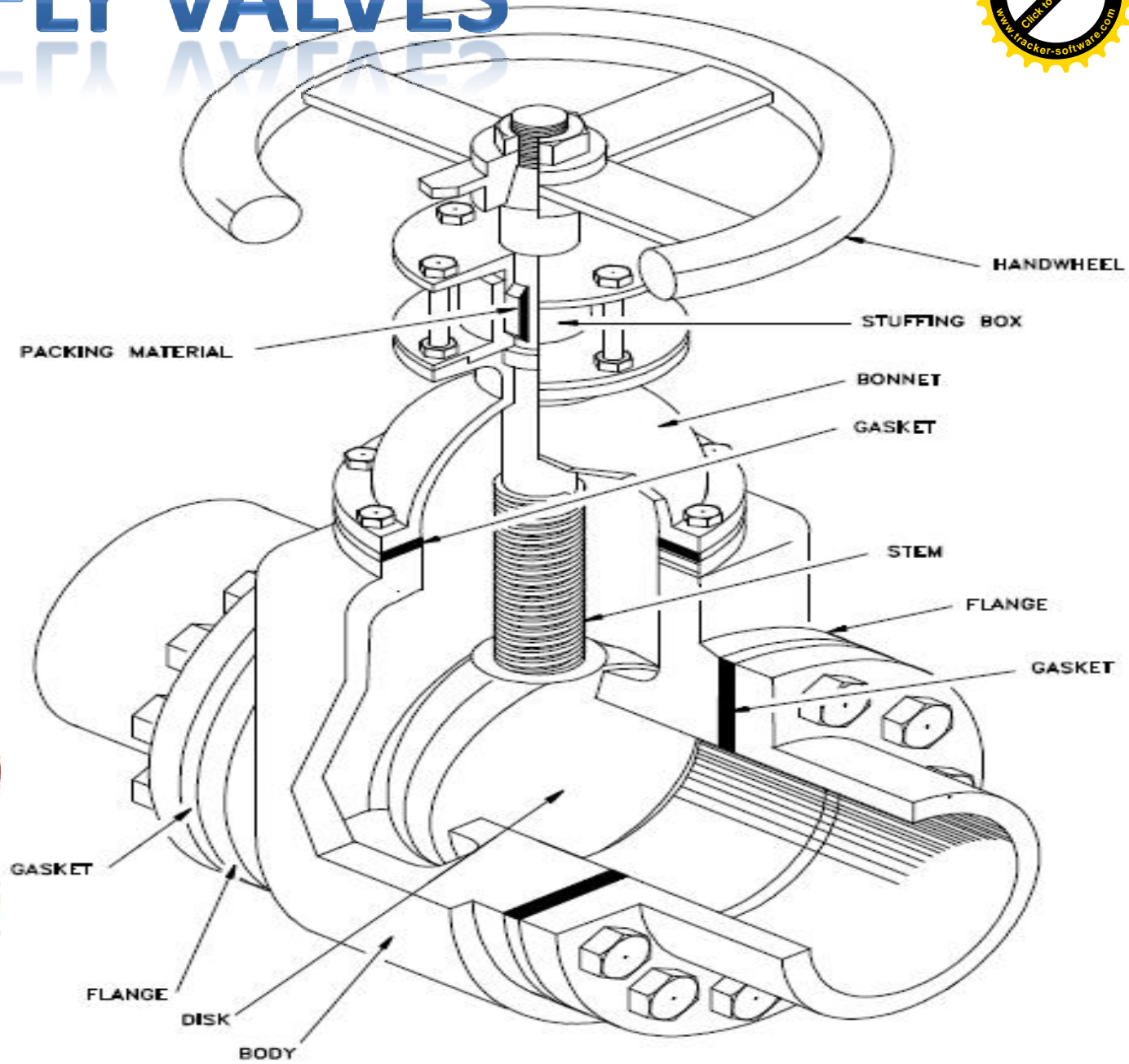
# Butterfly Valves

- Butterfly valves, like ball valves, operate with a 1/4 turn. They are generally used for handling large flows of gases or liquids, including slurries, but should not be used for throttling for extended periods of time. They are also very compact relative to flanged gate and ball valves.





# BUTTERFLY VALVES



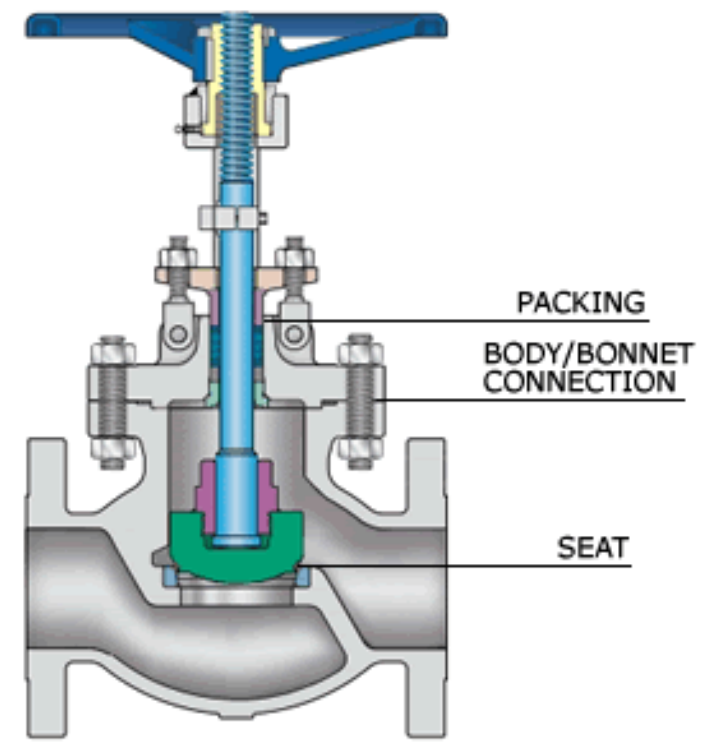
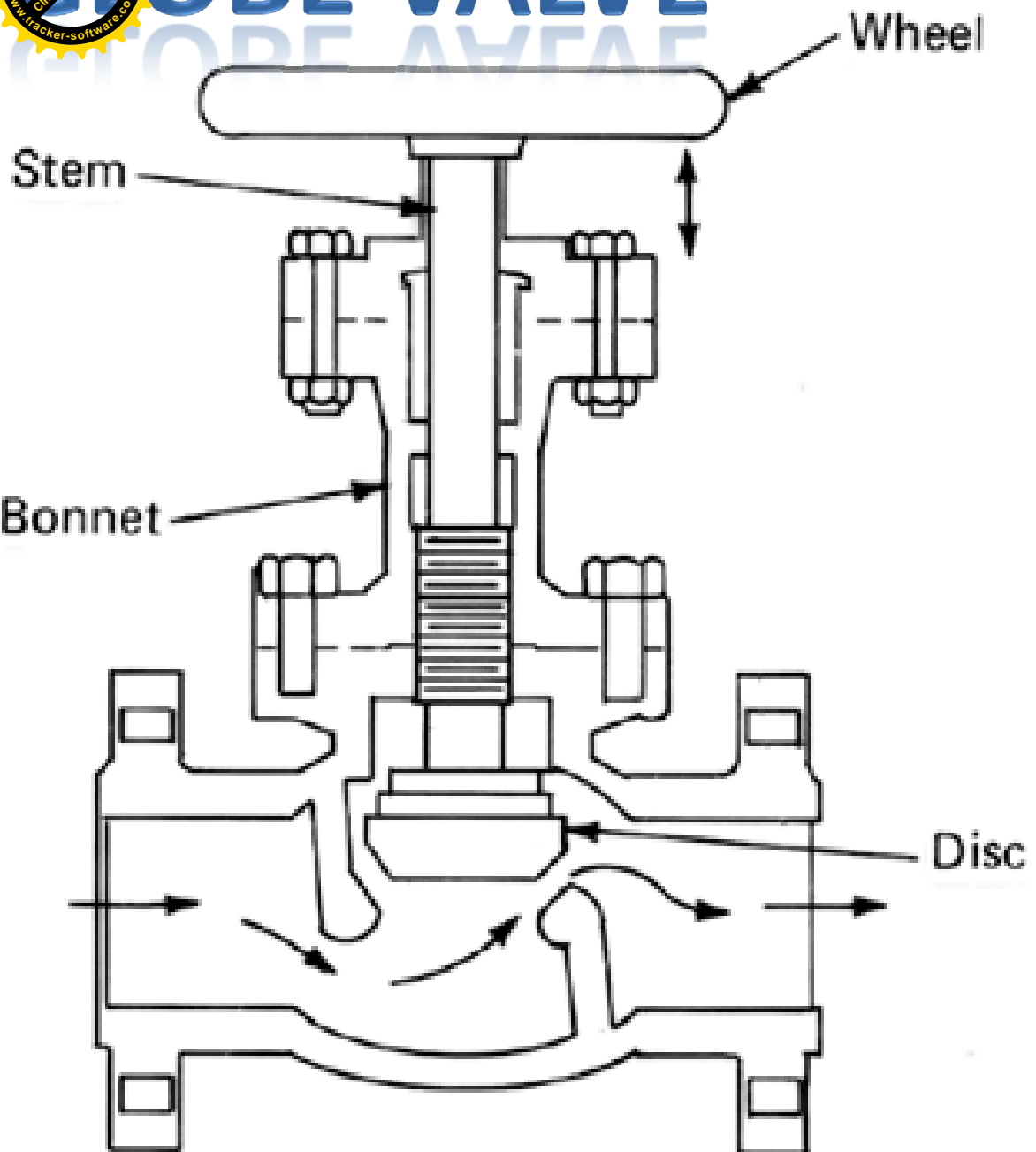


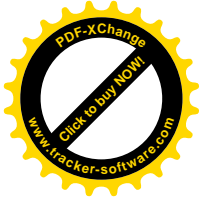
# Globe Valves

- Globe valves, as is the case with all valve designs, have both advantages and disadvantages. Like a gate, they close slowly to prevent fluid hammer. You can throttle the flow and they will not leak under low pressure when they are shut off. Flow and pressure control valves as well as hose bibs generally use the globe pattern. The disadvantage of this design is that the "Z" pattern restricts flow more than the gate, ball, or butterfly valves.



# GLOBE VALVE



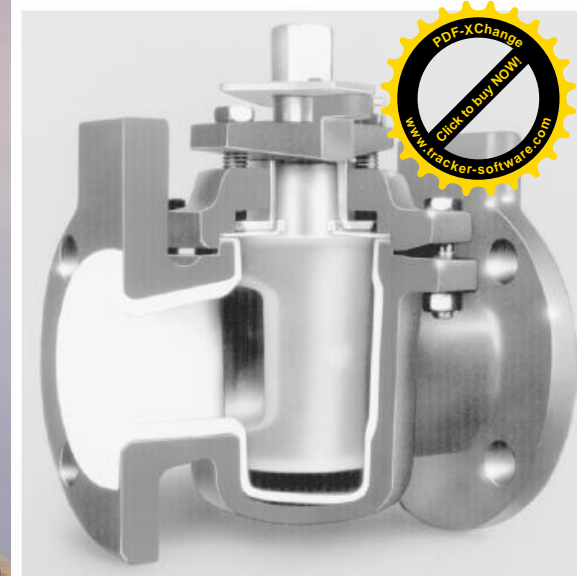


# Plug valves

- Like the gate valve, a plug valve has an unobstructed flow, yet requires only a 90 degree turn to open it. It also requires very little headroom. Stem corrosion is minimal because there are no screw threads. Almost all plug valves now are furnished with an elastomeric-coated plug and will seal off drip tight. However, plug valves are available in much larger sizes than ball valves and are highly suitable for use in wastewater plants.



# PLUG VALVE





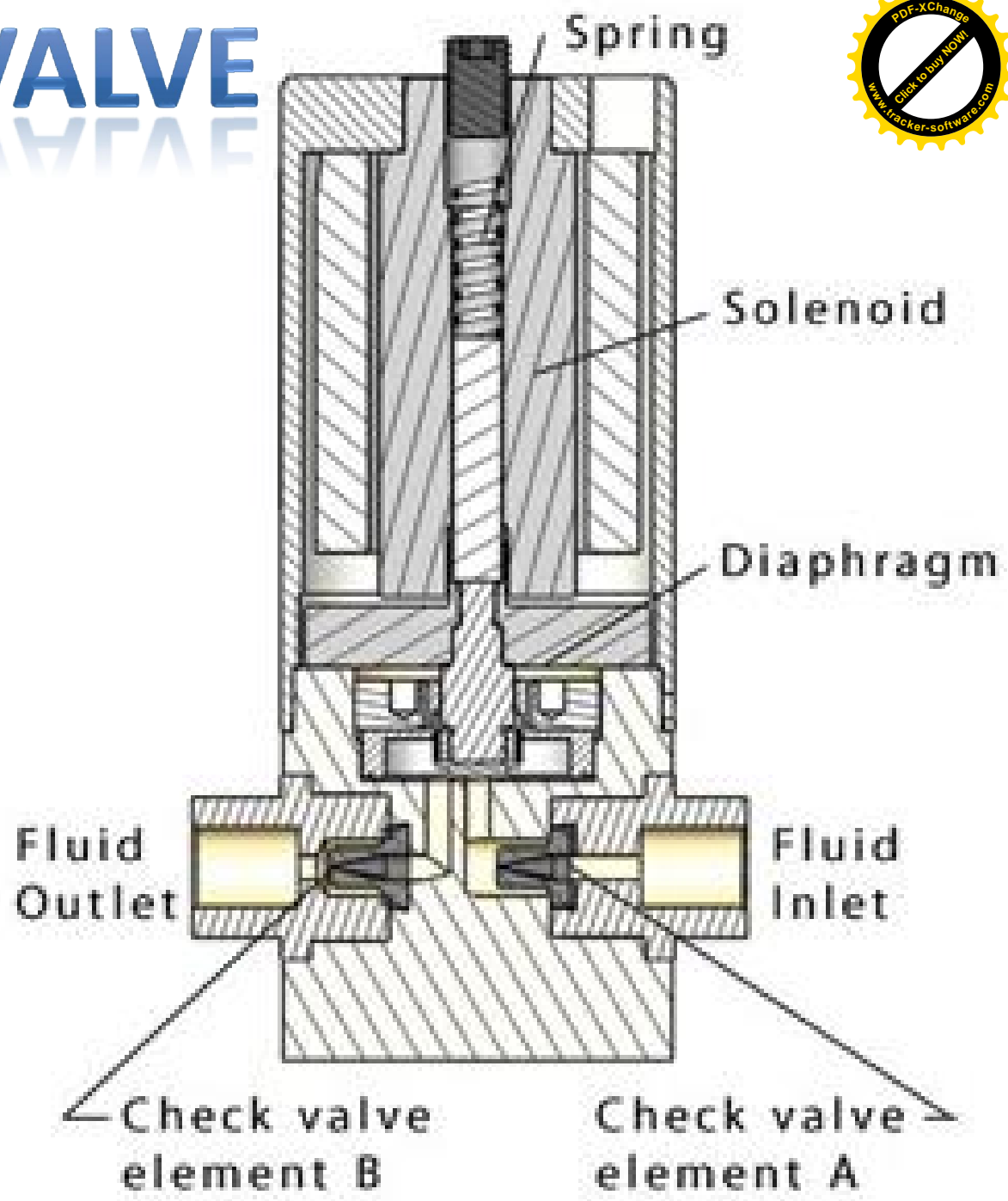
# Solenoid Valves

- Solenoid Valves are simple electrically operated devices. The valve plug is held in place by a spring. When electric power is applied to the solenoid (Energized), the current draw through the coil generates an electromagnetic force which opposes the spring, causing the plug to change position. When power is taken away (De-energized), the spring returns the plug to the normal position. Solenoid valves are ideal for fluid shutoff and switching in general service applications. Proportional solenoid control valves are available for modulating service.





# SOLENOID VALVE





THANK  
YOU