

VALVE SELECTION CRITERIA

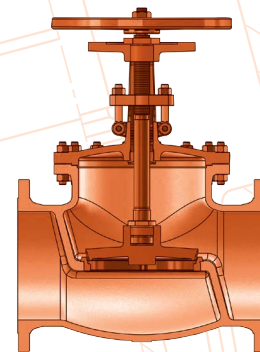
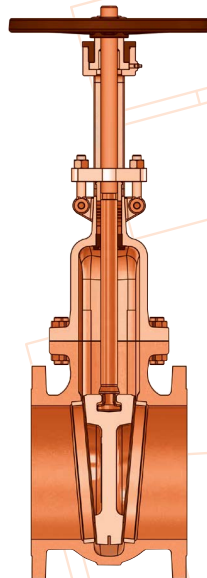
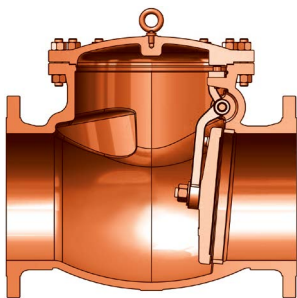
Applications (150LB ~ 600LB)

	Globe	Swing Check	Wedge Gate	Ball
Application Requirements	Extended Service	●	●	●
	Fugitive Emission Possible	●	●	●
	High Flow Capacity	●	●	●
	Low Torque	●	●	●
	Reduced Maintenance	●	●	●
Function	Diverting	○	○	●
	On/Off	●	●	●
	Throttling	●	○	○
Media	Abrasive Slurries	●	●	○
	Clean Liquids & Gases	●	●	●
	Corrosive Liquids & Gases	●	●	●
	Dirty Liquids & Gases	●	●	●
	Dry Materials	○	○	○
	Fibrous Slurries	●	●	○
	Hazardous Liquids & Gases	●	●	●
	Scaling Liquids & Slurries	●	●	○
	Vacuum Service	●	●	●
	Viscous Liquids	●	●	●

● Recommended

● Limited Application

○ Not Suitable



Selection Guide

TYPE	FUNCTION	DESIGN	ADVANTAGES	DISADVANTAGES
Gate (wedge)	On/off	A straight-through valve incorporating a rising-wedge gate.	Widely used on water duties but can be used for control of process fluids. Cheap compared to ball and plug in large sizes and generally made of cast iron or steel. Full flow	When used for throttling will suffer erosion and where solids are carried at high velocities, seat and wedge should be hardfaced, (e.g. with Stellite 6 or tungsten carbide). The groove in the base is liable for blockages. Can be "overshot" causing seizure.
Gate (parallel)	On/off	More sophisticated version of wedge.	Used mainly for steam duties at high pressure. Available in full port.	As above.
Plug	On/off	A straight through valve incorporating a rotating plug. Lubricated plug for critical service under pressure. Non-lubricated plug (sleeved plug). PTFE sleeve for frictionless operation.	Can be fully PTFE-lined and hence have very good chemical resistance.	Lubricant can cause contamination of products and limit the temperatures of operation. Lubricated not widely used because of level of maintenance required. Pressure/temperature conditions limited by lining material. Lubricated and non lined style liable to seizure in service.
Globe	Throttling (needs suitable materials)	Widely used for regulating flow consisting of a rising plug from the seat.	Wide range of sizes and pressure/temperatures.	Not available as a lined valve.
Ball	On/Off.	Straight-through flow.	Widely used for corrosive conditions and range of pressure/temperature. Can be made fire-safe.	Poor throttling. Not suitable for fluids containing solids which damage seats.
Needle	Throttling.	Fine regulation of flow.	Suitable for high pressures.	Available only in smaller sizes.
Butterfly	On/off. Can be used for occasional throttling (very low pressures only) if suitably designed.	Very simple design consisting of a flat disc rotating into a seat.	Available in a wide range of materials including many linings and coatings. Suitable for large flows of gases, liquids and slurries. Relatively cheap, particularly in larger sizes. Slim Design.	Reduced flow, especially in smaller sizes.
Diaphragm	Throttling can be used for on/off duties.	Glandless type of valve incorporating a flexible diaphragm and available either as a weir type or as full bore.	Widely used for corrosive fluids, but good where leakage must be avoided.	Limited on pressure and temperature by diaphragm materials. Not recommended for mains insulation.
Check	Prevention of backflow.	Automatically prevents backflow.	Wide pressure/temperature range.	Not reliable on critical duties unless fitted with special seat inserts, counter weights, etc.
Safety	Safety and protection.	"Pop-open" valve for gases and vapours (steam).	Reseats.	Only for gases: prevents excess pressure.
Relief	Safety and protection.	Proportional life valve for liquids.	Reseats.	Only for liquids: prevents excess pressure.
Bursting disc	Safety and protection.	Protection of plant systems where very rapid pressure rises may occur.	Instantaneous unrestricted relief. Wide range of materials available.	Not-reclosing and expendable. Subject to corrosion and creep if hot, causing premature failure.

Material Service & Suitability Industrial Valves

VALVE BODY	USAGE
Cast Iron/Steel Carbon Steel Grey cast iron Malleable iron Nodular (SG) iron Austenitic (Ni-resist) iron	Water, steam, alkaline conditions, dry solutions, organic substances. Grey cast iron and carbon steel are unsuitable for use in sea water without protection (such as cathodic protection or coating). Sea water, brackish water, waste water.
Stainless Steels Martensitic Austenitic Duplex Super Austenitic Super Duplex	Generally good corrosion resistance to waters, alkalis, some acids and dry solvents. Oil and gas process fluids. Unsuitable for use in sea water. Type 304 unsuitable for use in sea water. Type 316 may be used in sea water but can suffer crevice corrosion unless subject to galvanic protection. Alloy 20 used for sulphuric and phosphoric acid duties. More corrosion resistant than type 316 especially to chloride SCC. Excellent corrosion resistance to a wide range of fluids including sea water, produced waters, brines, caustic and mineral acids.
Copper Alloys Brass Bronze Gunmetal Phosphor Bronze Aluminium Bronze Nickel Aluminium Bronze	Water, steam, unsuitable for use in sea water. Generally good corrosion resistance in waters including sea waters. Unsuitable for strong alkalis. Brackish water, sea water. NAB has good corrosion resistance in sea water. Should not be used where water is 'sour' i.e. contains hydrogen sulphide.
Aluminium Aluminium and Alloys	Not usually used in chemical plant.
Nickel Alloys Alloy 400 Alloy 625 Alloy 825 Alloy B-2 Alloy C-276	Generally good resistance to a wide range of acids and alkalis. Resistance to sea water and brine but can suffer crevice corrosion. Excellent sea water crevice corrosion resistance. Resistant to organic alkalis and salts, H ₂ S and some acids. Principally used for HCl under reducing conditions (all strengths). Good resistance to a wide range of waters and chemicals.
Titanium and Alloys Tantalum	Suitable for a wide range of acids, alkalis and sea water. Poor under reducing conditions.
Non Metallics Glass Reinforced Plastic (GRP) Polyvinylchloride (PVC) Polypropylene PVDF, FEB, PTFE	Suitable for water, sea water. Used for acids and alkalis. Acids, alkalis, solvents and other organic substances.
Ceramics Sintered Solids Coatings	Used for valve balls & seats wear ring. Resistant to a wide range of fluids. Care should be taken to ensure that materials containing binders are acceptable for given duty.
Linings and Coatings Glass/Enamel Ebonite, natural rubber, Polypropylene PVDF, FEP, PTFE Note	All conditions except pure water, hydrofluoric acid and hot alkalis. Non-oxidising acids and alkalis. Most organic substances, acids and alkalis. Holes in linings and coatings can result in severe corrosion. It is vital that the surface be correctly prepared before coating and tested after coating.