



## VALVE SELECTION CRITERIA

Applications (150LB ~ 600LB)

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

● Recommended

○ Limited Access

X Not Suitable

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2/3, MUNICIPAL INDUSTRIAL ESTATE, KESHAVRAO KHADYE MARG, BYCULLA WEST, MUMBAI – 400 011 (INDIA)



## Selection Guide

<b>TYPE</b>	<b>FUNCTION</b>	<b>DESIGN</b>	<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
<b>Gate (Wedge)</b>	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 hard-faced, (e.g. with Stellite 6 or tungsten carbide). The groove in the base is liable for blockages. Can be “over-shut” causing seizure.
<b>Gate (Parallel)</b>	On/Off	More sophisticated version of wedge.	Used mainly for steam duties at high pressure. Available in full port.	When used for throttling will suffer erosion and where solids are carried at high velocities, seat and wedge should be hard-faced, (e.g. with Stellite 6 or tungsten carbide). The groove in the base is liable for blockages. Can be “over-shut” causing seizure.
<b>Plug</b>	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 has 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.
<b>Globe</b>	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.
<b>Ball</b>	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.
<b>Needle</b>	Throttling	Fine regulation of flow.	Suitable for high pressures.	Available only in smaller sizes.

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TYPE	FUNCTION	DESIGN	ADVANTAGES	DISADVANTAGES
<b>Butterfly</b>	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.
<b>Diaphragm</b>	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.
<b>Safety</b>	Safety and protection	“Pop-open” valve for gases and vapours (steam).	Reseats	Only for gases: prevents excess pressure.
<b>Relief</b>	Safety and protection	Proportional life valve for liquids.	Reseats	Only for gases: prevents excess pressure.
<b>Bursting Disc</b>	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 of Industrial Valves

VALVE BODY	USAGE
<p style="text-align: center;"><u>Cast Iron/Steel</u></p> <p style="text-align: center;">Carbon Steel Grey Cast Iron Malleable Iron Nodular (SG) Iron</p> <p style="text-align: center;">Austenitic (Ni-resist) Iron</p>	<p>Water, steam, alkaline conditions, dry solutions, organic substances.</p> <p>Grey cast iron and carbon steel are unsuitable for use in sea water without protection (such as cathodic protection or coating).</p> <p>Sea water, brackish water, waste water.</p>
<p style="text-align: center;"><u>Stainless Steels</u></p> <p style="text-align: center;">Martensitic</p> <p style="text-align: center;">Austenitic</p> <p style="text-align: center;">Duplex</p> <p style="text-align: center;">Super Austenitic Super Duplex</p>	<p>Generally good corrosion resistance to waters, alkalis, some acids and dry solvents.</p> <p>Oil and gas process fluids. Unsuitable for use in sea water. Type 304 unsuitable for use in sea water.</p> <p>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.</p> <p>More corrosion resistant than type 316 especially to chloride SCC.</p> <p>Excellent corrosion resistance to a wide range of fluids including sea water, produced waters, brines, caustic and mineral acids.</p>
<p style="text-align: center;"><u>Copper Alloys</u></p> <p style="text-align: center;">Brass</p> <p style="text-align: center;">Bronze</p> <p style="text-align: center;">Gunmetal Aluminium Bronze</p> <p style="text-align: center;">Nickel Aluminium Bronze</p>	<p>Water, steam, unsuitable for use in sea water.</p> <p>Generally good corrosion resistance in waters including sea waters. Unsuitable for strong alkalis</p> <p>Brackish water, sea water.</p> <p>NAB has good corrosion resistance in sea water. Should not be used where water is 'sour' i.e. contains hydrogen sulphide.</p>
<p style="text-align: center;"><u>Aluminium</u></p> <p style="text-align: center;">Aluminium and Alloys</p>	<p>Not usually used in chemical plant.</p>

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VALVE BODY	USAGE
<p style="text-align: center;"><u>Nickel Alloys</u></p> <p style="text-align: center;">Alloy 400</p> <p style="text-align: center;">Alloy 625</p> <p style="text-align: center;">Alloy 825</p> <p style="text-align: center;">Alloy B-2</p> <p style="text-align: center;">Alloy C-276</p>	<p>Generally good resistance to a wide range of acids and alkalis.</p> <p>Resistance to sea water and brine but can suffer crevice corrosion.</p> <p>Excellent sea water crevice corrosion resistance.</p> <p>Resistant to organic alkalis and salts, H<sub>2</sub>S and some acids.</p> <p>Principally used for HCl under reducing conditions (all strengths).</p> <p>Good resistance to a wide range of waters and chemicals.</p>
<p style="text-align: center;"><u>Titanium and Alloys</u></p> <p style="text-align: center;">Tantalum</p>	<p>Suitable for a wide range of acids, alkalis and sea water.</p> <p>Poor under reducing conditions.</p>
<p style="text-align: center;"><u>Non Metallic</u></p> <p style="text-align: center;">Glass Reinforced Plastic (GRP)</p> <p style="text-align: center;">Polyvinylchloride (PVC) Polypropylene</p> <p style="text-align: center;">PVDF, FEB, PTFE</p>	<p>Suitable for water, sea water.</p> <p>Used for acids and alkalis.</p> <p>Acids, alkalis, solvents and other organic substances.</p>
<p style="text-align: center;"><u>Linings and Coatings</u></p> <p style="text-align: center;">Glass/Enamel</p> <p style="text-align: center;">Ebonite, natural rubber, Polypropylene</p> <p style="text-align: center;">PVDF, FEB, PTFE</p>	<p>All conditions except pure water, hydrofluoric acid and hot alkalis.</p> <p>Non-oxidising acids and alkalis.</p> <p>Most organic substances, acids and alkalis.</p>
<p style="text-align: center;"><u>Ceramics</u></p> <p style="text-align: center;">Sintered Solids Coatings</p>	<p>Used for valve balls &amp; 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.</p>

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