PolyQuik®
Advanced
Materials Inc.

NON-METALLIC CONTROL VALVES FOR CORROSIVE CHEMICALS

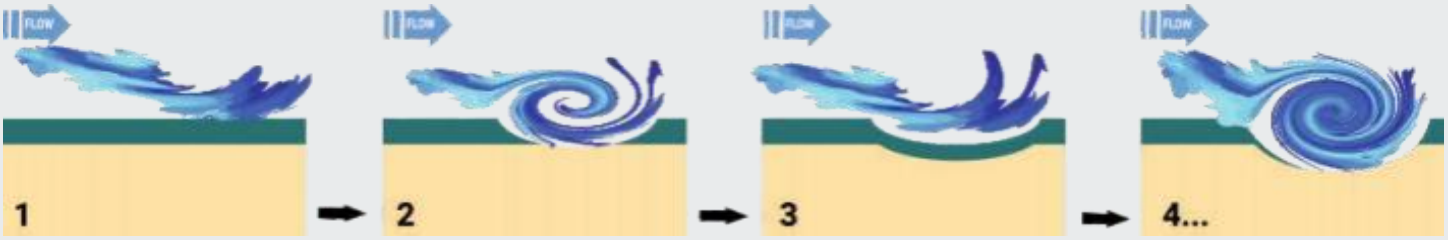
DN25 to DN150

VALVE MATERIAL

Where the flow velocity is high, corrosive chemicals cause unexpected kinds of damage to the materials. In the vena contracta, metals will show signs of erosion-induced corrosion, even if they are corrosion-resistant as piping or body materials. PFA or PTFE lining will erode quickly, particularly when the valve is used with a high delta-P. Once eroded, the base metal, usually cast iron, is quickly attacked, causing a severe leakage to the outside. PolyQuik non-metallic flow control valves are the longest lasting solution for controlling the flow of corrosive water based chemicals because no metals are used in the construction of the flow related components.

WHY NON-METALLIC MATERIALS?

The corrosion resistance of metals is generally appreciated in still fluids (static situation). But at high flow speeds and in the presence of turbulence, a process known as « erosion induced corrosion » starts destroying even the so-called « corrosion resistant » metals.
In such situation, solid polymers may offer an economic solution, that will outperform even "special metals" and other exotic materials.



A protective laver preventstainless steel fromcorroding

Due to flow velocity, thislay er is attacked leavingunprot ected steel to corrosion

a new layer can form o n thenew steel surface

this layer will ultimately beeroded and more corrosionwill occur.

BEST CHOICE IN POLYMER MATERIALS

PPS/PPO

PPS Material properties: high strength, has c ertain heat cold insulation,corrosion resistance

Material	Weight loss (mg/1000 rev.) ASTM D4060, wheel CS-10
PPS	5 - 10 ✓
PPO	5 - 8 ✓
PA 6 polyamid	5
ECTFE, Halar®	13 ✓
PP homopolymer	15 - 20 ✓
~~PTFE~~	~~500 - 1000~~ ⚠
304 stainless steel	50

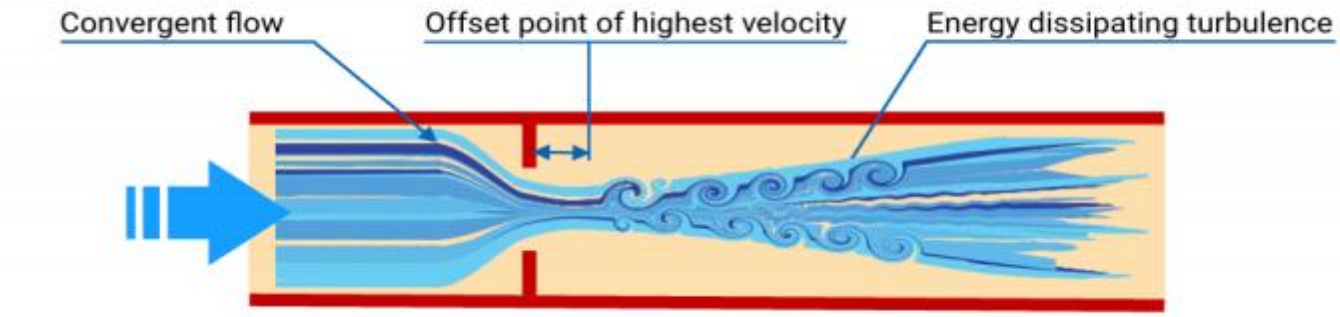
It is readily seen that PTFE, which has the lowest abrasion resistance of all polymers, is the worst choice for contact with the flow in the Vena Contracta. However, because of its almost universal chemical resistance,
PTFE is often found as a liner in control valves, either globe valves or diaphragm valves.
Such valves suffer a fast deterioration of the flow throttling parts, such as discs, seats, diaphragms etc.

VALVE DESIGN

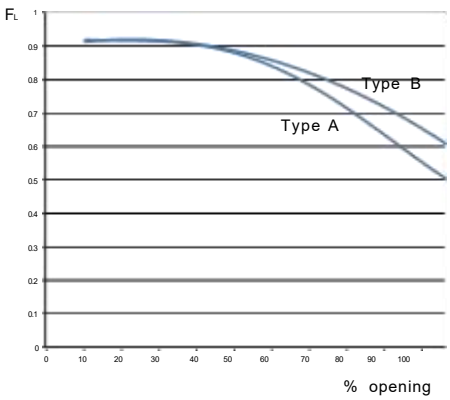
The range of PolyquiK compact control valves type V covers flows of 1 m3/h to 150 m3/h under 1 bar ΔP, with either a linear response,or an Equal Percentage response. The shaped V-masks, made of PVDF or PPS, are precisely machined to obtain stable and reproducible flow rates adapted to each process situation.
It is well known that ordinary ball valves are not suitable for flow control.
The addition of a shaped mask in front of the ball completely changes this situation. The mask forms a " variable area orifice" , partially limited by the ball. As the ball turns, the passage area increases.
The shape of the mask determines the control characteristic of the valve.

HIGH PERFORMANCE HYDRODYNAMIC DESIGN :

This concept is different from V-shaped and C-shaped balls. In PolyquiK' s design, the soft PTFE seat is not impacted by the high velocity flow of the vena contracta. By virtue of hydrodynamics, the point where the velocity is fastest is in the middle of the ball, away from any surfaces that could be impacted by erosion.
Acting like an orifice plate, the mask offers the required delta-P without much flow velocity. The erosive effect is there fore limited,and theLiquid Pressure Recovery Factor FL is almost as high at that of globe valves
Cavitation and turbulences are therefore limited, providing low noise, low vibration, and a long lifetime



OUTLASTING OTHER TYPES OF CONTROL VALVES



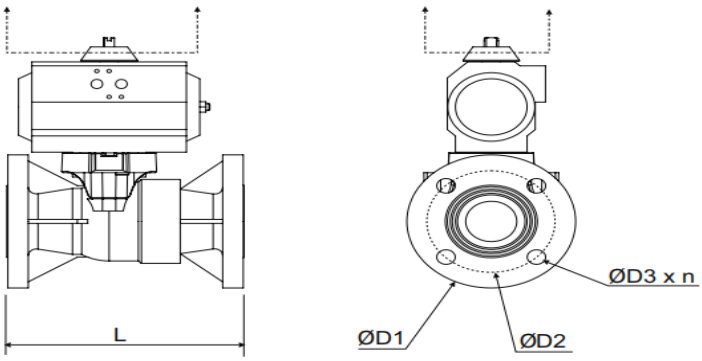
V-port Ball Valves from Techlink are by far the best choice for handling water based corrosive chemicals, even when laden with abrasive particles.

Through the combination of :
- Abrasion resistant polymers selected from the table on the left,
- High pressure recovery factor providing the required pressure loss with a limited flow velocity in the vena contracta,
- Protection of soft PTFE seats from the flow,

they outperform and outlast fluoropolymer lined steel valves, most high nickel alloy valves, and all cases of diaphragm valves.

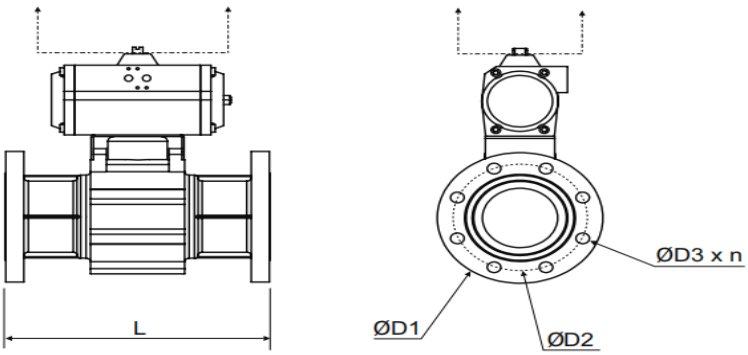
TECHNICAL DATA

PRESSURE RANGE	VACUUM TO 1 Mpa G
TEMPERATURE RANGE	-20°C to 100°C (PVDF) 150°C (PPS)
CONNECTION STYLE	FLANGED
CONNECTION SIZES	DN 25 to DN 150
FLANGES STANDARDS	EN 1092-1 PN10 , or ASME B16.5 150#
FACE-TO-FACE LENGTH	EN 558-1
BODY MATERIAL	PPS/PPO PPGF PVDF
BALL MATERIAL	PPS/PPO PPGF PVDF
SEATS MATERIAL	PTFE
O-RINGS MATERIALS	EPDM or FKM or FFKM
BOLTING AND FITTINGS	316 L
STEM SEAL	O-RING,² WITH ISO 15848 performance
ACTUATOR TYPE	RACK & PINION
ACTUATOR BODY MATERIAL	POLYARYLAMIDE OR ALUMINIUM
MIN. AIR PRESSURE REQUIRED	0.45 Mpa
FAIL ACTION	OPEN, CLOSE, or DOUBLE ACTION
POSITIONER TYPE	FLAP & NOZZLE
POSITIONER (RECOMMENDED)	SAMSON 3725 or 3730
TRIM TYPE	EQUAL % or LINEAR
TIGHTNESS CLASS	CLASS VI (IEC 60534-4)



DN	ØD1 mm	ØD2 mm	ØD3 mm	n	L mm
25	115	85	14	4	160
40	150	110	18	4	200
50	165	125	18	4	230

FLANGES AS PER PN 10 HG/T 20592(A), FF



DN	ØD1 mm	ØD2 mm	ØD3 mm	n	L mm
80	200	160	18	8	310
100	220	180	18	8	350

FLANGES AS PER PN 10 HG/T 20592(A), FF

A PolyquiK non-metallic V-Type control valve can be delivered with either a LINEAR characteristic or an EQUAL PERCENTAGE characteristic. All our models are tested on our test loop. Individual valves may, at the customer's request, be loop-tested, and the test report delivered with the valve.

Our engineers will calculate the most suitable combination of size and V-port contour from the customer's process data.

They will also advise on the best equipment suitable to the process :

To avoid undesirable stress and deformation of the valve structure, the associated accessories should be as light as possible. Whenever they exist, and except when they are prohibited by explosion zone rules, equipment with non-metallic bodies or casing are preferred. Heavy top-work needs to be supported and is not recommended..

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State of the art innovation in flow control of corrosive chemicals.

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