

PLAST-O-MATIC

VALVES, INC.

[HOME](#) > [ENGINEERING & TECHNICAL](#) > [TECHNICAL ARTICLES](#) > [INTRODUCTION TO SOLENOID VALVES](#)

Technical Articles

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Introduction to Solenoid Valves

True Blue® Solenoid Valves help you stop, allow or redirect flow. Because of the extensive variety of body design and coil combinations available from stock, Plast-O-Matic has a valve to meet both your processing needs and electrical requirements.

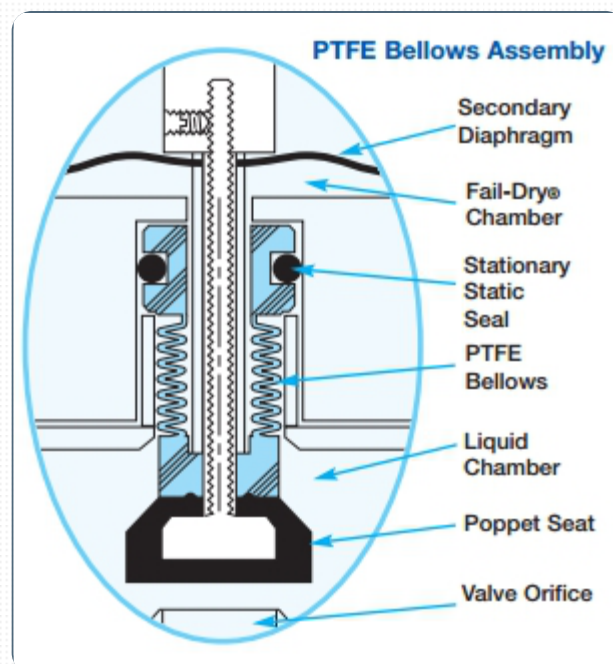
Below: Close up of typical Plast-O-Matic PTFE bellows solenoid valve design, with special patented Fail Dry® Safety Vent

Overview of the True Blue Solenoid Valve Line...

Plast-O-Matic offers one wetted core design; the rest are high-performance designs with the patented Fail-Dry safety vent, and absolutely no wetted metals. Most are direct acting, normally-closed. A pilot-operated model offers higher pressures and flows, and one normally-open model is available. The rest are 3-way (also known as diverter valves) or specialty items.

This is a quick introduction, moving from the most basic offering to the most specialized. Immediately below is an overview of Plast-O-Matic's approach to Solenoid Valve design, followed by capsule descriptions with links to detailed catalog pages.

- Feature rugged thermoplastic construction with no wetted metal parts.
- EAS- Series 2-way, PS Series 2-way, and THP Series 3-way feature the patented [Fail Dry](#) safety vent.
- NEMA 4X coils — with DIN connector — available as

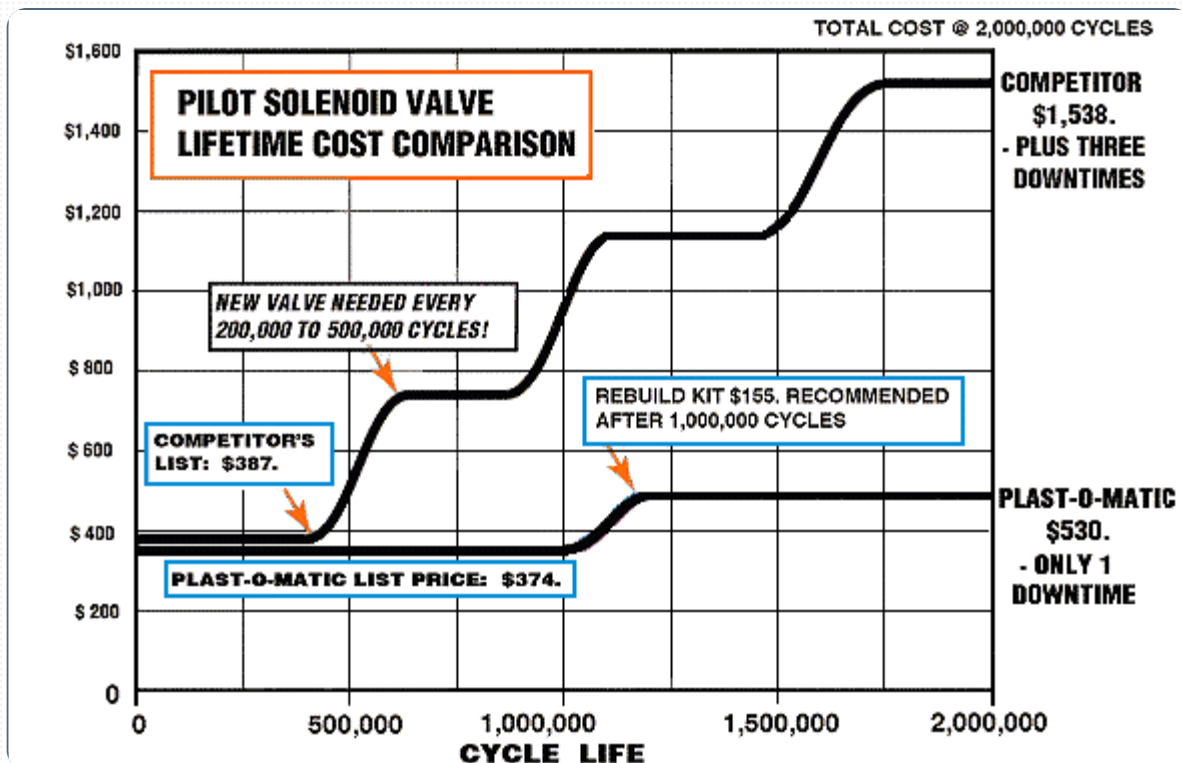


standard on every valve.

- Z-COOL energy-saving, lighted connector available — standard on W24 Coil.
- Many types of AC and DC coils available for most valves.
- Bodies are machined or molded from top quality brand plastics, including Geon® PVC, Corzan® CPVC, Kynar® PVDF, PTFE, Glass-Filled Polypro, and Natural, unpigmented Polypropylene.
- PTFE bellows designs prevent fugitive emissions.
- Seals standard in FKM and EPDM; optional materials such as Buna nitrile and Kalrez® readily available. Seal material on PTFE bellows design is a specially-treated FKM, so that one valve can handle virtually all liquids.
- Most direct-acting valves rated for full vacuum through pressure.
- Popular models, sizes and materials ship from stock.
- As your assurance of quality, each valve is individually tested under pressure by a Plast-O-Matic inspector prior to shipment.

True Blue Valves are Cost Efficient

When comparing valves, it is important to consider both the operating life, and how easily/costly it is to service the valve. Below is a lifetime cost comparison chart, pitting the Plast-O-Matic True Blue® Series PS against a well known competitive brand...



- The valves compared are 1" NPT pilot-operated solenoid valves, with PVC bodies and FKM seals. Prices are per catalog, January 2001, and are subject to change.
- The Plast-O-Matic valve has a 9.5 Cv rating with a rated pressure range of 5 – 140 psi.
- The competition's valve has a 10.3 Cv rating with a rated pressure range of 7 – 85 psi.
- Plast-O-Matic recommends inspection at 1,000,000 cycles. Assuming a rebuild kit is required — and it may not be — the valve can be returned to like-new condition in a few minutes, without any special training. Cost of the rebuild kit is \$155.
- The competitor states: "The valve will last 200,000 to 500,000 cycles, at which point we recommend buying a new valve, because the rebuild kit is virtually the entire valve and costs approximately the same."
- Even when competitive valves are priced hundreds of dollars *lower*, Plast-O-Matic users still come out wa

ahead in terms of cost per cycle. For example, if the initial cost of the other valve were \$174, the total life cycle cost in this comparison would still be \$166 more than Plast-O-Matic...not to mention the staggering cost of multiple downtimes.

Series EAST:

Unsurpassed performance in a compact plastic solenoid valve. High pressure ratings and considerable flow rates, PTFE bellows barrier type dynamic seal, and **Fail Dry** safety vent make this valve ideal for acids, caustics, solvents, chlorine solutions and ultra-pure liquids. Available with 3/16" orifice for high pressures or 1/4" orifice for high Cv.

- Full vacuum through 140 PSI inlet, 70 PSI backpressure rating; 70 inlet & 60 backpressure with larger orifice.
- 0.5 Cv factor; 0.8 with larger orifice.
- 2,000,000+ cycle life (tested under laboratory conditions).
- Continuous duty, NEMA 4X CSA approved coil.
- 1/4" & 1/2" NPT size in Geon® PVC, Virgin Polypropylene, and Kynar® PVDF. Elastomer seat seal in FKM or EPDM.



Series EASMT & EASYMT:

Million-cycle, bubble-tight shutoff, with no metal parts in wetted area. Design features tremendous corrosion and atmospheric resistance, PTFE bellows dynamic seal and upper diaphragm seal with **Fail Dry** safety vent. Suitable for all types of solutions.

Series EASMT: 1/2", 3/4" & 1" Designed for high flows and relatively high pressures.

Series EASYMT: 1/4" & 1/2" Designed for high pressures and relatively high flow rates.

- PTFE bellows design.
- No minimum pressure or differential required for operation.
- Pressure, drain or vacuum service.
- 2,000,000+ cycle life (tested under laboratory conditions).
- Wide range & ratings of coils available.
- Available in Geon® PVC, G-Polypropylene, and Kynar® PVDF. Elastomer seals in FKM or EPDM. Alternate materials available w/quantity orders.



Series PS:

Million-cycle, bubble-tight shutoff, with no metal parts in wetted area. Requires line pressure for operation. Design features tremendous corrosion and atmospheric resistance, PTFE bellows design dynamic seal and upper diaphragm seal with **Fail Dry** safety vent. Suitable for most solutions, although proper caution should be taken when specifying for liquids prone to crystallization.



- PTFE bellows design.
- 5 PSI minimum pressure differential required for operation.
- Pressure service only.
- 1,000,000+ cycle life (tested under laboratory conditions).
- 11 watt, NEMA 4X CSA approved coil.
- Complete range of sizes: 1/2", 3/4", 1", 1-1/2", 2" & 3".
- Available in Geon® PVC, Corzan CPVC, Natural Polypropylene, and Kynar® PVDF. Elastomer seals in FKM or EPDM. Alternate materials available w/quantity orders.

Series EASY-NO (NORMALLY OPEN):

For applications requiring a valve to remain open when de-energized, or when it would be dangerous for a valve to **close** during a power failure. (e.g. cooling towers, emergency systems, etc.)

Million-cycle, bubble-tight shutoff, with no metal parts in wetted area. Design features a non-sticking PTFE shaft with a 4 u-cup seal, plus upper seal with **Fail Dry** safety vent. Suitable for most solutions, although proper caution should be taken when specifying for liquids prone to crystallization because of the u-cup design.



- PTFE shaft.
- Multi-use design: Pressure, drain, or vacuum service.
- 1,000,000+ cycle life (tested under laboratory conditions).
- W24 coil standard
- 1/4" & 1/2" NPT sizes, with 1/4" orifice.
- Fail safe "open"; this valve automatically de-energizes to an open position in the event of a power loss.
- Available in Geon® PVC. Elastomer seals in FKM or EPDM. Alternate materials available w/quantity orders.

Series THP 3-way design:

Diverter or “sampling” valves with no metal parts in wetted area. Design features a non-sticking shaft with an upper and lower diaphragm separating the liquid from opposing springs, plus secondary seals with **Fail Dry** safety vents. Suitable for all solutions. Series THP is not specifically designed for vacuum service; consult factory if needed.

- Ultra-smooth, balanced shaft permits use with high backpressures.
- Bubble-tight sealing.
- No metal parts in wetted areas.
- 24W coil standard
- ¼” & ½” NPT sizes, with variety of orifice sizes.
- Can be converted to 2-way if needed.
- Available in Geon® PVC. Elastomer seals in FKM or EPDM. Alternate materials available w/quantity orders.

