Poly-Guard™ SERIES

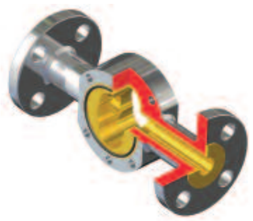
POLYMER-LINED STAINLESS STEEL GEAR PUMP

Liquiflo®

Description: THE TOUGHEST COMBINATION...

Liquiflo has long recognized the need for a Plastic Rotary Positive Displacement Pump for the chemical industry. While engineered plastics offered unsurpassed chemical resistance to virtually any fluid, they severely lacked the mechanical strength, integrity and safety of high-alloy metals. Therefore, the challenge was to use a combination of metal and plastic to produce a highly corrosion resistant pump that was safe to use in industrial applications. We chose a Fluoro-Polymer for its superior chemical resistance, and Stainless Steel for its strength and corrosion resistance (giving the pump one more layer of protection). Liquiflo perfected a specialized molding and machining technique for mechanically bonding, stabilizing and machining the plastic to exacting tolerances required to make a positive displacement pump.

The ultimate outcome was the Poly-Guard™, which combines the chemical resistance of a Fluoro-Polymer with the strength of Stainless Steel.



Typical Uses & Applications

The Poly-Guard™ is an excellent choice for inorganic acids, bases and salts. The Poly-Guard™, with its tough Stainless Steel exterior and chemically resistant Fluoro-Polymer interior, offers the ultimate solution for your most difficult chemical applications. These pumps are durabie, safe and corrosion resistant, and unlike fiber-reinforced plastic pumps, they can also be used in high purity services where contamination from process system components must be avoided.

Typical Chemicals

Hydrochloric Acid
Ferric Chloride
Sulfuric Acid
Hydrofluoric Acid
Sodium Hypochlorite
Nitric Acid
Sodium Hydroxide
Chromic Acid
Fluorosilicic Acid
Hydrogen Bromide
Bromine

Markets

Chemical
Water Treatment
Pharmaceutical
Pulp & Paper
Electronics
Food & beverage
High Purity Service
...etc.

Metering

Gear pumps, due to their nearly pulseless flow, are preferred in many metering applications. When used with a VFD in a PID-controlled feedback loop, the pump can deliver exceptionally accurate flow. The input signal can be based on many different parameters – pH and flow being two of the most common.

Advantages

- The Poly-Guard™ offers both internal and external protection against corrosive fluids and harsh environments
- Strong Stainless Steel body handles pipe stresses and typical treatments found in industrial environments
- Fluoro-Polymer-lined for ultimate protection against any corrosive liquids, such as Acids, Caustics, Inorganic Salts and others
- A variety of non-metallic materials for internal components such as PEEK, Kynar (PVDF), Teflon, Silicon Carbide and TTZ, were chosen for exceptional wear resistance and chemical compatibility, allowing pump to be optimized for the intended service
- Ideal for high purity services (All wetted parts are non-metallic)
- Sealless Mag-Drive configuration prevents leakage
- Rotary Gear Pump design deliverer a smooth, pulseless flow which is desirable for both metering and transfer applications
- Close-Coupled configuration simplifies installation and maintains perfect alignment of pump and motor
- Product is extremely simple in design and easy to maintain and repair
- Available in 7 sizes to match your flow requirements up to 15 GPM (57 LPM)

PUMP MODEL CODING

EXAMPLE:

P3LPPBB100BVU, designates a Model P3 Pump with the following mat'l selection.

P3	L	P	P	B	B	1	0	0	B	V	U
1	2	3	4	5	6	7	8	9	10	11	12

Pos.	Description	Selection	
1	Pump Model	P3	**P3 Pump**
2	Body Mat'l/Ports	L	**SS/PFA & ANSI Flanges**
3	Drive Gear Mat'l	P	**PEEK**
4	Idler Gear Mat'l	P	**PEEK**
5	Wear Plate Mat'l	B	**Silicon Carbide**
6	Bearing Mat'l	B	**Silicon Carbide**
7	Motor Frame Size	1	**0.875" (143/145TC)**
8	Containment Can	0	**Alloy-C/PFA-Lined**
9	Bearing Flush	0	**None**
10	Shafts	B	**Silicon Carbide**
11	O-Rings	V	**Viton**
12	Mag Coupling	U	**MCU**

Liquiflo's Model Code describes both the pump's size and materials selected. This model code is required for the future identification of your pump when reordering either a pump or replacement parts.

■ **Available**
⊗ **Not Available**
CF Contact Factory

Flanges available: ANSI & DIN

CONNECTION SIZES

	P1 – P4	P5 – P7
ANSI 150#	3/4	1 1/2
DIN PN16	20	40

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POLYMER-LINED STAINLESS STEEL GEAR PUMP

Selection & Availability

Sample Model No. P3 L P P B B 1 0 0 B V U
Position No. 1 2 3 4 5 6 7 8 9 10 11 12

Position			P1	P2	P3	P4	P5	P6	P7
1 Pump Model									
2 Body Material & Port Type	L = SS/PFA Lined & ANSI Flanges E = SS/PFA Lined & DIN Flanges		■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
3 Drive Gear	3 = Teflon 8 = Ryton P = PEEK K = Kynar		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
4 Idler Gear	3 = Teflon 8 = Ryton P = PEEK K = Kynar		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
5 Wear Plates	3 = Teflon B = Silicon Carbide E = Carbon 60		■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
6 Bearings	B = Silicon Carbide E = Carbon 60		■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
7 Motor Frame Size	0 = 0.625" (NEMA 56C) 1 = 0.875" (NEMA 143/145TC) 2 = 14 mm (IEC 71 - B5) 3 = 19 mm (IEC 80 - B5) 4 = 24 mm (IEC 90 - B5) 5 = 1.125" (NEMA 182/184TC) 8 = 28 mm (IEC 100/112 - B5)		■ ■ ■ ■ ■ ⊗ ⊗	■ ■ ■ ■ ■ ⊗ ⊗	■ ■ ■ ■ ■ ⊗ ⊗	■ ■ ■ ■ ■ ⊗ ⊗	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■
8 Containment Can	0 = Alloy-C/PFA-Lined F = Carbon Fiber/PFA-Lined		■ CF ■ CF	■ CF ■ CF	■ CF ■ CF	■ CF ■ CF	■ CF ■ CF	■ CF ■ CF	■ CF ■ CF
9 Bearing Flush	0 = Standard Housings (without Bearing Flush)		■	■	■	■	■	■	■
10 Shafts	B = Silicon Carbide Z = TTZ (Zirconia)		■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
11 O-Rings	E = EPDM V = Viton K = Kalrez	■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
12 Magnetic Coupling	U = (MCU) 75 in-lbs B = (MCB) 120 in-lbs		■ ■	■ ■	■ ■	■ ■	⊗ ■	⊗ ■	⊗ ■
Suffix Trim Options	- 8 = Temperature Trim - 9D = Viscosity Trim (double clearance) - 9T = Viscosity Trim (triple clearance)		■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■




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For over 35 years, Liquiflo pumps have handled thousands of difficult chemicals

A Revolutionary Innovation in Chemical Pump Technology...

The Liquiflo POLY-GUARD™

Polymer-Lined Stainless Steel Gear Pump

...The Ultimate Solution for Pumping Corrosive Chemicals

Combines the chemical resistance of Fluoro-Polymers with the strength of Stainless Steel

Liquiflo® Chemical Processing Pumps

Poly-Guard™

Liquiflo POLY-GUARD™ SERIES Polymer-Lined Stainless Steel Gear Pump

The Ultimate Solution for Pumping Corrosive Chemicals

Combines the chemical resistance of Fluoro-Polymer with the strength of Stainless Steel

THE TOUGHEST EXTERIOR

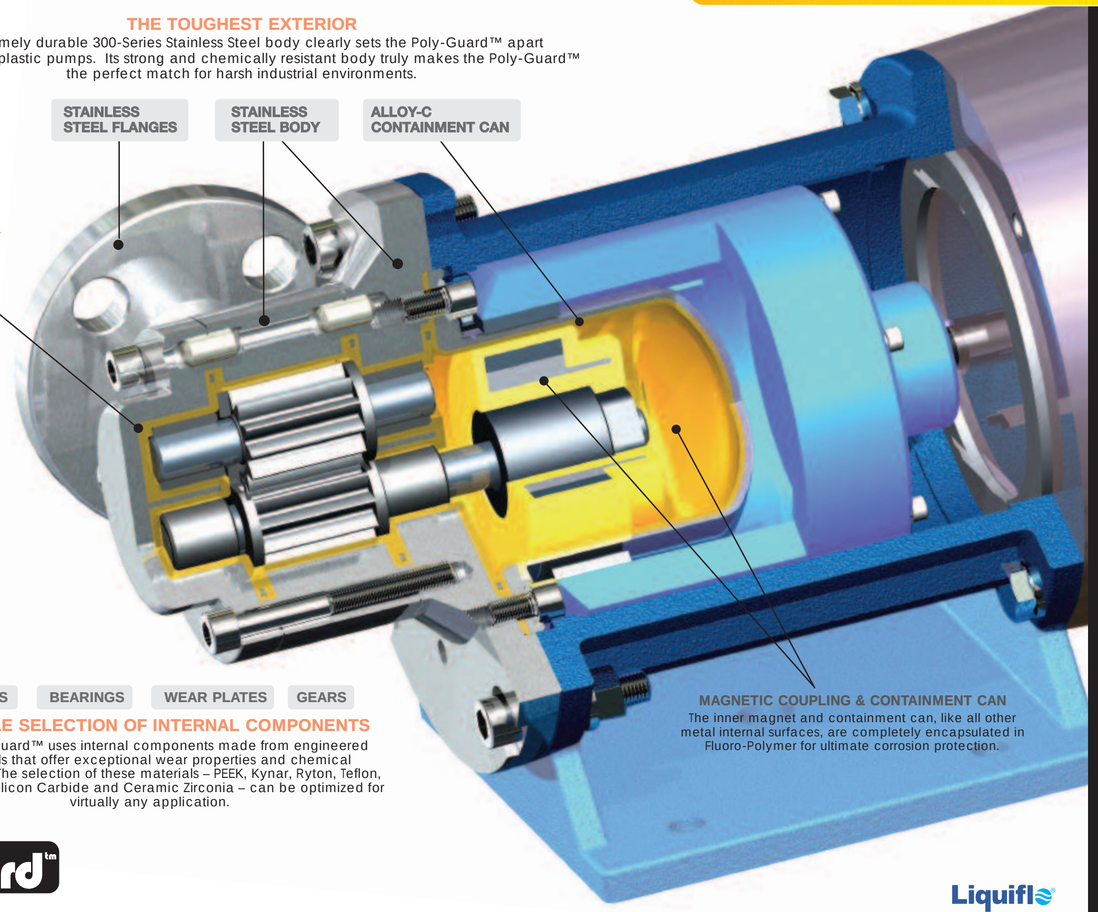
An extremely durable 300-Series Stainless Steel body clearly sets the Poly-Guard™ apart from all other plastic pumps. Its strong and chemically resistant body truly makes the Poly-Guard™ the perfect match for harsh industrial environments.

THE MOST CHEMICALLY RESISTANT INTERIOR

Fluoro-Polymer Plastic Lining resists the most corrosive chemicals

All inside surfaces contain a molded layer of Fluoro-Polymer – the most chemically resistant of all plastics. This layer (shown in yellow) is molded, mechanically fastened and chemically bonded to the Stainless Steel outer casing; then precision-machined to close tolerances.

This combination of the toughest exterior and the most chemically resistant interior is the ultimate solution for your most difficult pumping applications.



FLEXIBLE SELECTION OF INTERNAL COMPONENTS

The Poly-Guard™ uses internal components made from engineered materials that offer exceptional wear properties and chemical resistance. The selection of these materials – PEEK, Kynar, Ryton, Teflon, Carbon 60, Silicon Carbide and Ceramic Zirconia – can be optimized for virtually any application.

MAGNETIC COUPLING & CONTAINMENT CAN

The inner magnet and containment can, like all other metal internal surfaces, are completely encapsulated in Fluoro-Polymer for ultimate corrosion protection.

THE FLUORO-POLYMER LINER

The interior walls of the Stainless Steel housing are encased with perfluoroalkoxy plastic, which is a type of Fluoro-Polymer commonly known by its acronym, PFA. PFA was chosen because it's the most chemically resistant of all moldable plastics. In the Poly-Guard™ design, the PFA is supported by the Stainless Steel housing; therefore, no additional reinforcements (such as fiber fillers which are necessary to strengthen an all plastic pump) are needed. In fiber reinforced plastic pumps, these fillers can significantly reduce the chemical resistance of the plastic and potentially allow wicking of the chemical along the fiber matrix.

INTERNAL COMPONENTS

The Poly-Guard™ pump is offered with a wide selection of materials for its internal components. With Liquiflo's 35 years of experience in pumping extremely difficult chemicals, we can maximize the performance and reliability of the Poly-Guard™ for virtually any application. In several applications, by optimizing component selection, Liquiflo has exceeded 40,000 hours of MTBR.

SHAFTS Self-Sintered Silicon Carbide (SiC) or Transformation Toughened Zirconia (TTZ) Shafts for extreme wear resistance and chemical resistance.

BEARINGS Silicon Carbide Bearings for extreme life and wear resistance, or Carbon 60 Bearings for flexibility and dry-running capability.

GEARS Choice of PEEK, Kynar, Ryton or Teflon Gears to optimize performance for chemical applications.

CONTAINMENT CAN The standard containment can is made of Alloy-C, a high nickel alloy which is 40% stronger than Stainless Steel. Alloy-C has the added benefit of minimizing magnetically induced eddy current power losses that can add heat to the pumped product. The Poly-Guard™ is also offered with an optional Carbon Fiber containment can for complete elimination of eddy current losses.

REPAIR KITS

These pumps are extremely simple to repair and maintain. Either individual parts or complete repair kits that contain all internal components are available to economically rebuild the pump to like-new condition.

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POLYMER-LINED STAINLESS STEEL GEAR PUMP

MODEL **P 7**

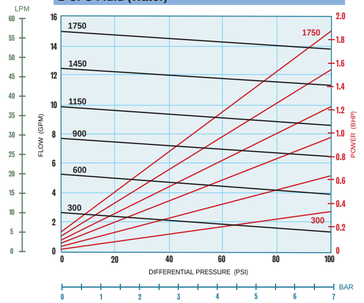
MAG-DRIVE, CLOSE-COUPLED

Port Size & Type	ANSI	1½" 150# RF Flanges
	DIN	40 mm PN16 RF Flanges
Theoretical Displacement [1]		.00859 gal/rev (.03251 L/rev)
Max Speed		1750 RPM
Max Flow Rate[1]		**15.0 GPM (56.9 LPM)**
Max Differential Pressure		100 PSI (7 bar)
Max Allowable Pressure [2]		275 PSIG (19 barg)
Max Temperature		200°F (93°C)
NPSHR @ Max Speed		4 ft (1.2 m)
Suction Lift (Dry)		7 ft (2.1 m)
Gear Type		Spur, External
Bearing Type		Sleeve /Journal
Motor Frame Sizes	NEMA	56C, 143TC, 145TC, 182TC, 184TC
	IEC	71, 80, 90, 100, 112 – B5 Flange
Weight, less motor (approx.)		63 lbs (29 kg)

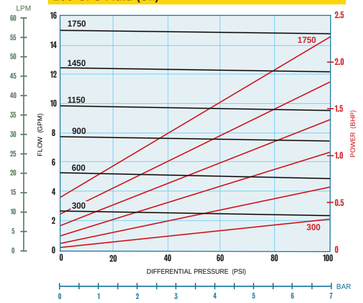
1 Based on Maximum Speed and zero Differential Pressure.
2 Based on pressure rating of ANSI 150# Flanges at ambient temperature.

PERFORMANCE CURVES

1 CPS Fluid (Water)



100 CPS Fluid (Oil)



P7: Mag-Drive, Close-Coupled

Dimensional Data: inches [mm]