Durco PolyChem™
Process Pumps
A Global Approach to Pump Design

Non-Metallic Pumps
• Sealed
• Sealless
ANSI / ISO / JIS

Bulletin P-30-500a (E)
Non-Metallic Pumps Designed To Global Standards

When considering non-metallic pumps, rely upon Flowserve as a pump consultant. Flowserve offers a line of non-metallic pumps in sealed or sealless models engineered to ANSI and ISO design criteria and to JIS drilling specifications. Flowserve can provide the best pump that most economically meets the application.

Pumps delivered worldwide are manufactured in Flowserve facilities, certified either to ISO 9001 or to 9002.

Heavy-duty PFA lined sealless pumps provide leak-free reliability and durability in the most demanding services.
- Sealless Magnetically Driven
- PFA Lined
- Long / Close Coupled
- ANSI / ISO / JIS

Heavy-duty PFA lined pumps with popular and innovative mechanical sealing options to handle the most corrosive processes.
- Mechanically Sealed
- PFA Lined
- Long Coupled
- ANSI / ISO / JIS

Solid Fiber Reinforced Plastic (FRP) mechanically sealed pump is specially formulated to provide toughness in addition to superior corrosion resistance.
- Mechanically Sealed
- Solid Fiber Reinforced Plastic (FRP)
- Long Coupled
- ANSI
Solid Fiber Reinforced Plastic (FRP) or PFA lined pumps feature unique mechanical sealing systems.

- Unique Mechanical Seal
- Fiber Reinforced Plastic / PFA Lined
- Long Coupled
- ANSI

Non-metallic chemical process pumps for specific application needs.

Pump protection for all steady load pumps, sealed and sealless.

Featuring the Polybase™ solid polymer concrete baseplate to complete the non-metallic pump package.

L-Series/20-21
L-Series Seals/22
Performance Curves/23

T-Line & Durcon E-Series/24

Family of Pre-Engineered Baseplates/26
Solid Polymer Concrete Polybase™/27
Durco PolyChem M-Series Pumps

Close coupled magnetically driven chemical process pumps
Durco PolyChem M-Series sealless pumps are rugged, heavy-duty pumps designed specifically for leak-free, reliable performance in demanding process applications.

Meets the following dimensional standards:
• ASME B73.1
• ISO 2858
• JIS drilling

Close Coupled Design
Minimizes space requirements with no need for shaft alignment

Non-Sparking Rub Pads
Prevent contact of critical components in the unlikely event of outer magnet support bearing failure

Non-Metallic Containment Shell
Fluoropolymer lined fiber glass shell to offer superior corrosion resistance and strength.
• Rated up to 250 psig (17 bar) applications
• Minimizes heat and improves efficiency over metallic designs

Jackbolts
Offer added safety and facilitate maintenance for plant personnel

Worldwide Application
PolyChem is the result of extensive market research with Flowserve customers around the world. Pump users stated the PolyChem pump must provide reliability and value while standardizing on a common global design.
Furthermore, customers wanted a choice of sealed or sealless designs and lined or solid non-metallic construction.
With the introduction of PolyChem, these requests have been fulfilled.
PolyChem M-Series closed coupled pumps cover a broad hydraulic range.

**Thirteen Sizes**
- Four (4) Group I (ANSI)
- Three (3) Group A (ISO)
- Three (3) Group II (ANSI)
- Three (3) Group B (ISO)
(See pages 10-11 for performance data.)

**Fluoropolymer**
- **PFA Lined Wet End** is globally preferred for its superior corrosion resistance and temperature allowance to 392°F (200°C). PFA is carbon reinforced where required for superior stiffness and strength.

**Rugged Metal Armor**
- Meets material specifications of ASTM A395 (ANSI models) and GGG40.3 (ISO models)

**Back Pullout Design**
- Allows for pump removal less casing

**Enclosed Impeller**
- Provides balanced hydraulic loads and superior efficiency compared to open impeller designs

**Capacities**
- **60 Hz**
  - To 750 gpm (170 m³/h)
  - To 625 gpm (140 m³/h)
- **50 Hz**
  - To 450 ft (135 m)
  - To 310 ft (95 m)

**Pressure/Temperature Limits**

**Rugged Silicon Carbide Bearings**
- Standard silicon carbide bearings offer the ultimate material for wear resistance and chemical inertness

**Separate Inner Magnet and Impeller Components**
- Significantly reduces impeller replacement cost compared with integral inner magnet/impeller assembly of competitive designs

**Rotating Shaft Design**
- Eliminates the need for shaft support obstructions in the casing inlet common with stationary shaft designs, which can affect performance and NPSHR
Durco PolyChem M-Series Pumps

Long coupled magnetically driven chemical service pumps Durco PolyChem M-Series sealless pumps are rugged, heavy-duty pumps designed specifically for leak-free, reliable performance in demanding process applications.

Meet the following dimensional standards:
• ASME B73.1
• ISO 2858
• JIS drilling

Long Coupled Design
Utilizes the proven design of Durco’s Guardian® and Chemstar® MD alloy magnetic drive pumps which offer traditional bearing housing configuration with flexible coupling
• Labyrinth seals are optional
• Lubrication options include oil, grease, oil mist and shielded and sealed bearings

Non-Sparking Rub Pads
Prevent contact of critical components in the unlikely event of outer magnet support bearing failure

Non-Metallic Containment Shell
Fluoropolymer lined fiber glass shell to offer superior corrosion resistance and strength.
• Rated up to 250 psig (17 bar) applications
• Minimizes heat and improves efficiency over metallic designs

Worldwide Application
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Furthermore, customers wanted a choice of sealed or sealless designs and lined or solid non-metallic construction.

With the introduction of PolyChem, these requests have been fulfilled.
PolyChem M-Series long coupled pumps cover a broad hydraulic range.

**Thirteen Sizes**
- Four (4) Group I (ANSI)
- Three (3) Group A (ISO)
- Three (3) Group II (ANSI)
- Three (3) Group B/C (ISO)
(See pages 10-11 for performance data.)

**Fluoropolymer**
PFA Lined Wet End is globally preferred for its superior corrosion resistance and temperature allowance to 300°F (149°C).
- PFA is carbon reinforced where required for superior stiffness and strength

**Rugged Metal Armor**
Meets material specifications of ASTM A395 (ANSI models) and GGG40.3 (ISO models)

**Back Pullout Design**
Allows for pump removal less casing

**Enclosed Impeller**
Provides balanced hydraulic loads and superior efficiency compared to open impeller designs

**Power Frame Pullout**
allows for safe power end maintenance without breaking sealed containment

**Jackbolts**
Offer added safety and facilitate maintenance for plant personnel

**Capacities**
- 60 Hz
  - To 750 gpm (170 m³/h)
- 50 Hz
  - To 625 gpm (140 m³/h)

**Heads**
- 60 Hz
  - To 450 ft (135 m)
- 50 Hz
  - To 310 ft (95 m)

**Pressure/Temperature Limits**

**Rugged Silicon Carbide Bearings**
Standard silicon carbide bearings offer the ultimate material for wear resistance and chemical inertness

**Separate Inner Magnet and Impeller Components**
Significantly reduces impeller replacement cost compared with integral inner magnet/impeller assembly of competitive designs

**Rotating Shaft Design**
eliminates the need for shaft support obstructions in the casing inlet common with stationary shaft designs, which can affect performance and NPSHR
**Durco PolyChem M-Series Pumps**

M-Series pump components are designed for superior pump performance.

- **PFA Lined Casing**
  Ductile cast iron armor with a minimum liner thickness of 1/8 in (3 mm) PFA, the PolyChem pump offers superior corrosion resistance to 300°F (149°C). Durco’s proprietary molding processes assure liner integrity.

- **Large Silicon Carbide Rotating Shaft**
  Offers ruggedness simply not found in other non-metallic pumps. PolyChem’s rotating shaft is supported by silicon carbide bearings located securely in a reinforced fluoropolymer bearing holder, thereby eliminating the need for bearing support in the inlet of the pump.

- **Radial and Axial Thrust Bearings**
  Standard silicon carbide bearings offer the ultimate material for wear resistance and chemical inertness.

- **Non-metallic Containment Shell with Rugged Fluoropolymer Lining**
  - Offers superior corrosion resistance and is fully rated up to 260 psig (17 bar) applications.
  - Non-metallic construction offers excellent magnet efficiencies and eliminates any magnetic losses or heat generation found with metallic shells.
Enclosed PFA Impeller
Bearing life is extended due to the enclosed impeller’s balanced loads. Unlike integral impeller/inner magnet designs, Durco’s separate impeller offers economic savings if replacement is necessary.

Non-Sparking Rub Pads
Prevent contact of critical components in the unlikely event of outer magnet support bearing failure.

Ruggedly Designed with the Customer in Mind
The Durco PolyChem M-Series Pump was designed to offer customers the optimum in pump reliability and value, while maintaining a simple design for safety and ease of maintenance.
PumpSel™
Exclusively from Flowserve, this accurate pump selection software program is available from your local Flowserve sales representative. This software assures correct sizing and selection of pumps and magnetic couplings to best suit your process application needs. PumpSel also aids in checking the suitability of existing pumps when process requirements change.
PolyChem

M-Series
Performance Curves

ISO

M-Series
Group A & B
2900 rpm (50 Hz)

Available Sizes:
1. 50 x 32-160
2. 80 x 65-160
3. 65 x 40-200
4. 50 x 32-250
5. 80 x 50-250
6. 100 x 65-250

M-Series
Group A & B
1450 rpm (50 Hz)
Worldwide Application
PolyChem is the result of extensive market research with Flowserve customers around the world. Pump users stated the PolyChem pump must provide reliability and value while standardizing on a common global design.

Furthermore, customers wanted a choice of sealed or sealless designs and lined or solid non-metallic construction.

With the introduction of PolyChem, these requests have been fulfilled.

Polychem S-Series—Revolutionary non-metallic pump technology
Durco plastic lined sealed pumps offer outstanding performance and significant economy in highly corrosive process applications. Incorporating the advanced design and precision manufacture of the rugged, heavy-duty Mark III chemical service pump significantly enhances bearing and seal life. The PolyChem S-Series pump is engineered to maximize mean time between planned maintenance (MTBPM).

Meets the following dimensional standards:
- ASME B73.1
- ISO 2858/5199
- JIS drilling

A Choice of Power Ends
- Mark II A features
- ANSI 3A™ power end (shown here) featuring Inpro VBX bearing isolators and a three-year performance guarantee
- Clean room assembly assures optimum lubrication environment

Fastest Maintenance Turnaround Time
- Micrometer adjustment accurately sets impeller clearance to rear cover in 20 seconds... in the shop or field
- Mechanical seals and all critical settings can be accurately set in the shop

Silicon Carbide Shaft Sleeve
Provides optimum corrosion and wear resistance

Power End Options
- Alloy shaft sleeves
- Solid shafts
- Labyrinth oil seals
- Magnetic drain plug
- Oil slinger
- Regreasable or double shielded bearings
- Oil mist systems

Worldwide Application
- ASME B73.1
- ISO 2858
- Option for JIS flange drilling

Meets the following dimensional standards:
- ASME B73.1
- ISO 2858/5199
- JIS drilling

Durco PolyChem
S-Series Pumps

Polychem S-Series—Revolutionary non-metallic pump technology
Durco plastic lined sealed pumps offer outstanding performance and significant economy in highly corrosive process applications. Incorporating the advanced design and precision manufacture of the rugged, heavy-duty Mark III chemical service pump significantly enhances bearing and seal life. The PolyChem S-Series pump is engineered to maximize mean time between planned maintenance (MTBPM).
PolyChem S-Series sealed pumps cover a broad hydraulic range.

**Nineteen Sizes**
- Four (4) Group I (ANSI)
- Three (3) Group A (ISO)
- Six (6) Group II (ANSI)
- Six (6) Group B/C (ISO)
(See pages 16-17 for performance data.)

**Capacities**
- 60 Hz
  - To 1400 gpm (320 m³/h)
- 50 Hz
  - To 1150 gpm (260 m³/h)

**Heads**
- 60 Hz
  - To 725 ft (220 m)
- 50 Hz
  - To 505 ft (155 m)

**Pressure/Temperature Limits**
- 60 Hz
  - To 725 ft (220 m)
  - To 505 ft (155 m)
- 50 Hz
  - To 725 ft (220 m)
  - To 505 ft (155 m)

**Fluoropolymer PFA Lined Wet End**
is globally preferred for its superior corrosion resistance and temperature allowance to 300°F (149°C).

**Enclosed Impeller Design**
provides balanced hydraulic loads and superior efficiency compared to open impeller designs.

**Exclusive Oversized “FM” Seal Chamber**
The FM (flow modifier) is designed to self flush the mechanical seal to offer longer seal life, reduced costs, and improved pump and seal reliability. (See page 15 for more details.)

**Multiple Seal Accommodation**
Readily available and economical seal selections may be utilized. (See Page 14 for typical seal arrangements.)

**Unique Seal Chamber Canister**
allows for double component seals to be applied in the FM seal chamber
- Enables quick retrofit of different seal styles
- Eliminates the need for stocking additional rear covers

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PolyChem S-Series sealed pumps cover a broad hydraulic range.

**Nineteen Sizes**
- Four (4) Group I (ANSI)
- Three (3) Group A (ISO)
- Six (6) Group II (ANSI)
- Six (6) Group B/C (ISO)
(See pages 16-17 for performance data.)

**Capacities**
- 60 Hz
  - To 1400 gpm (320 m³/h)
- 50 Hz
  - To 1150 gpm (260 m³/h)

**Heads**
- 60 Hz
  - To 725 ft (220 m)
- 50 Hz
  - To 505 ft (155 m)

**Pressure/Temperature Limits**
- 60 Hz
  - To 725 ft (220 m)
  - To 505 ft (155 m)
- 50 Hz
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  - To 505 ft (155 m)

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allows for double component seals to be applied in the FM seal chamber
- Enables quick retrofit of different seal styles
- Eliminates the need for stocking additional rear covers

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**Sealing Options**

PolyChem S-Series pumps offer the advantage of innovative and readily available seal selections. Shown here are standard and recommended seal arrangements.

- **Non-Metallic Single Cartridge**
- **Double Component (Collar Drive)**
- **Non-Metallic Single External**
- **Double Component (Friction Drive)**
- **Metallic Single Cartridge**
- **Non-Metallic Double Cartridge**
- **Metallic Single Component**
- **Metallic Double Cartridge**
**Flow Modifiers Extend Mechanical Seal MTBPM**

- Flow modifiers redirect flow from circumferential to axial
- Balanced flow with low pressure drop in the chamber helps keep solids in suspension, minimizing erosive characteristics of the process
- A mechanical seal creates a centrifuging action away from its parts and into the returning flow path of the process liquid
- Solids merge in the returning flow path and are flushed out of the seal chamber
- The high flow rate prevents suspended solids from precipitating or crystallizing to seal or seal chamber.

For SealSentry video and proof of performance contact your local Flowserve sales office.
S-Series
Group I & II
3500 rpm (60 Hz)
2900 rpm (50 Hz)

Available Sizes:
1. 1.5X1-6
2. 3X1.5-6
3. 3X2-6
4. 1.5X1-8
5. 2X1-10
6. 3X2-10
7. 4X3-10
8. 3X2-13
9. 4X3-13
10. 6X4-13

PumpSel™
Exclusively from Flowserve, this accurate pump selection software program is available from your local Flowserve sales representative. This software assures correct sizing and selection of pumps to best suit your process application needs.

PumpSel also aids in checking the suitability of existing pumps when process requirements change.
PolyChem
S-Series
Performance Curves

ISO

S-Series
Group A & B
2900 rpm (50 Hz)

Available Sizes:
1. 50 x 32-160
2. 80 x 65-160
3. 65 x 40-200
4. 50 x 32-250
5. 80 x 50-250
6. 100 x 65-250
7. 65 x 40-315
8. 100 x 65-315
9. 125 x 100-315

S-Series
Group A & B
1450 rpm (50 Hz)
**Durco PolyChem F-Series Pumps**

**FRP Pumps for Severe Corrosive Services**

The Durco FRP (fiber glass reinforced plastic) ANSI centrifugal pumps and Self-Priming versions complete the PolyChem line of corrosion resistant pumps.

Durcon 730 is glass fiber reinforced thermo-setting epoxy resin. This material is specially formulated to provide high strength and toughness in addition to corrosion resistance.

**Fastest Maintenance Turnaround Time**

- Micrometer adjustment accurately sets impeller clearance to rear cover in 20 seconds... in the shop or field
- Mechanical seals and all critical settings can be accurately set in the shop

**Built to ASME B73.1 dimensions**

**A Choice of Power Ends**

- Mark IIIA features
- ANSI 3A™ power end (shown here) featuring Inpro VBX bearing isolators and up to a three-year performance guarantee

**Superchlor® (SD77) shaft is standard. A complete list of options is available.**
F-Series Hydraulic Range includes:
• Three (3) standard sizes
• Two (2) Self-Priming sizes

Pressure/Temperature Limits

All wet end components are one-piece solid compression molded for superior strength

F-Series Self-Priming Pumps are an excellent choice for the following applications when corrosive media is present:
• Industrial Sumps
• Waste Treatment
• Pond Transfer
• Tank Car Unloading
• Lift Stations

Composite Performance Curves
The ANSI dimensional Durco Mark III L-Series non-metallic pump combines the performance and maintenance benefits of the Mark III Standard ANSI pump with design features that solve the most common pump problems: seals that fail too frequently and materials that can't stand up to tough corrosives and rough treatment.

### A Choice of Power Ends
- Mark IIIA features
- ANSI 3A™ power end (shown here) featuring Inpro VBX bearing isolators and up to a three-year performance guarantee

### Power Frame Options
- Alloy shaft sleeves
- Labyrinth oil seals
- Magnetic drain plug
- Oil slinger
- Regreasable or double shielded bearings
- Oil mist systems

### Fastest Maintenance Turnaround Time
- Micrometer adjustment accurately sets impeller clearance to rear cover in 20 seconds...in the shop or field
- Mechanical seals and all critical settings can be accurately set in the shop
Six Sizes
- Two (2) Group I
- Four (4) Group II

 Capacities
- 60 Hz
  To 1000 gpm (230 m³/h)
- 50 Hz
  To 830 gpm (190 m³/h)

 Heads
- 60 Hz
  To 460 ft (140 m)
- 50 Hz
  To 320 ft (73 m)

 Pressure/Temperature Limits

Fluoropolymer PFA lined with FRP armor wet end components or optional solid Durcon® 730 FRP
(Group II only)

PFA lined ductile cast iron armor
(Group I only)

Encapsulated PFA Impeller design provides high efficiency

Unique mechanical seal
- Rotating seal face locked in the back of the impeller
- Massive portion of the seal and springs are stationary in the chamber which allows the seal to flex to match shaft deflection
- Eliminates shaft fretting
- Metal parts of seal are not exposed to corrosive process liquid

Enlarged space around seal area between the impeller and the cover
- Better circulation and seal face cooling
- Self-flushing of the seal faces
**Durco PolyChem L-Series Pumps**

**Single Mechanical Seals**

- **Standard Single Seal**
- **Single Seal With Optional Lip Seal And Flush Fittings**

**Double Mechanical Seals**

- **Standard Double Seal**
  For Use With External Flush
- **Double Seal With Pumping Sleeve**
  For Use With ANSI Plans 7352 Or 7353
Flowserve is recognized for its proud history of non-metallic pump development. The following pumps were industry firsts and are still available today for specific process applications:

**T-Line**
Molded PTFE and PFA pump components. ANSI dimensional. For more information, please see Bulletin P-15-100.

**E-Series**
Durcon is an epoxy resin, modified to provide the optimum combination of corrosion resistance and strength. For more information, please see Bulletin P-13-101.

- **Five Sizes**
  - One (1) Group I
  - Four (4) Group II
- **Capacities**
  - To 800 gpm (182 m³/h)
  - Heads
  - To 173 ft (58 m)

- **Four Sizes**
  - One (1) Group I
  - Three (3) Group II
- **Capacities**
  - To 800 gpm (182 m³/h)
  - Heads
  - To 190 ft (63 m)
The KW941 Pump Power Monitor is easy to install on new or existing pump installations. All connections and controls are located at motor starter electrical enclosure as shown at right. Costly instrumentation wiring to the pump is eliminated.

**KW941 Pump Power Monitor**

The KW941 Pump Power Monitor monitors and displays actual power to the pump offering simultaneous protection from underload and overload operating conditions.

The KW941 helps to eliminate costly downtime and expensive pump repairs caused by:
- Dry running
- Pump overloads
- Cavitation
- Blocked lines
- Closed suction or discharge valves
- Excessive wear or rubbing

**Premium features for reliable protection**
- Push buttons display horsepower or kilowatts; automatic conversion when switching displays
- Adjustable low power and high power set points protect pump from underload and overload operation. Alarms can be tripped or pumps shut down before damage occurs
- Adjustable trip delay timers filter out nuisance trips caused by temporary power fluctuations
- Adjustable start up delay timer is particularly useful in self-priming applications
- 4 to 20 milliamp analog output facilitates remote displays, operator interface and output to PLC or DCS
- Two form C relay outputs for low and high power trips. Outputs can be used to shut down pump or trip alarms
- Automatic, manual and remote reset options for versatile operation

**Broad application range**
- Works on all pumps having steady (non-pulsating) loads: centrifugal; gear; turbine; ANSI; API; paper stock; sealed; mag drive; canned motor; self-priming

**Easy installation**
- Simple wiring procedure
- Easily installed on existing pump installations

**Easy setup & calibration**
- Settings controlled from front panel push buttons; no internal adjustments, dip switches or potentiometers
- Large digital display for easy viewing and accurate settings
- One step calibration can be performed without operating pump. No need to run pump at off-operating conditions to calibrate power monitor
- Settings can be viewed or adjusted during normal pump operation

**Rotating Equipment Division**

POLY SALES BLTN/Master.2 10/29/02 2:21 PM Page 12 Dan K. Snelson Scratch:p-30-500:
Flowserve offers a family of pre-engineered baseplate designs to extend MTBPM and reduce costs.

Reducing internal stress and vibration extends MTBPM of pump/motor packages. Pump users specify rigid baseplate designs to:
- Provide torsional lateral and longitudinal rigidity
- Improve vibration dampening through greater mass and design stiffness
- Protect against transit damage
- Resist twisting during installation
- Maintain designed-in shaft alignment
- Reduce installation and shaft alignment time
- Reduce diaphragming or separation from grout
- Improve pump/motor/seal MTBPM
- Reduce total life cycle pump/motor/seal costs

Flowserve recommends:
- Reinforced baseplate to extend MTBPM
- Level screw inserts for baseplates to be grouted to reduce cost and time
**Durco Solid Polymer Concrete Polybase™**

**Featuring Durco’s Solid Polymer Concrete Polybase™ and Polybloc™ Adjustment System**

- Available in three material combinations for broad range corrosion resistance.
  - ANSI and ISO standard designs
  - Low installed cost

- Superior vibration dampening
- Corrosion resistant
- Superior resistance to twisting or diaphragming
- Designed to be flat
- Available with or without catch basins and grout holes

**Polybloc™ – Motor Mounting Block**

- Flatter and more repeatable height tolerances than steel
- Corrosion resistant
- Superior vibration dampening
- Full foot support (no overhang)

**8-Point™ Adjuster**

- Allows precise motor adjustment to reduce alignment time
- Used with recessed bloc-lock device

**Leveling Screw Option**

- Four inserts supplied on sizes through 264. Six on larger sizes.

**Stilt Mounted Baseplate**

- Cross bars provided on sizes 139 through 264
- Support tubing provided on sizes 268 through 398