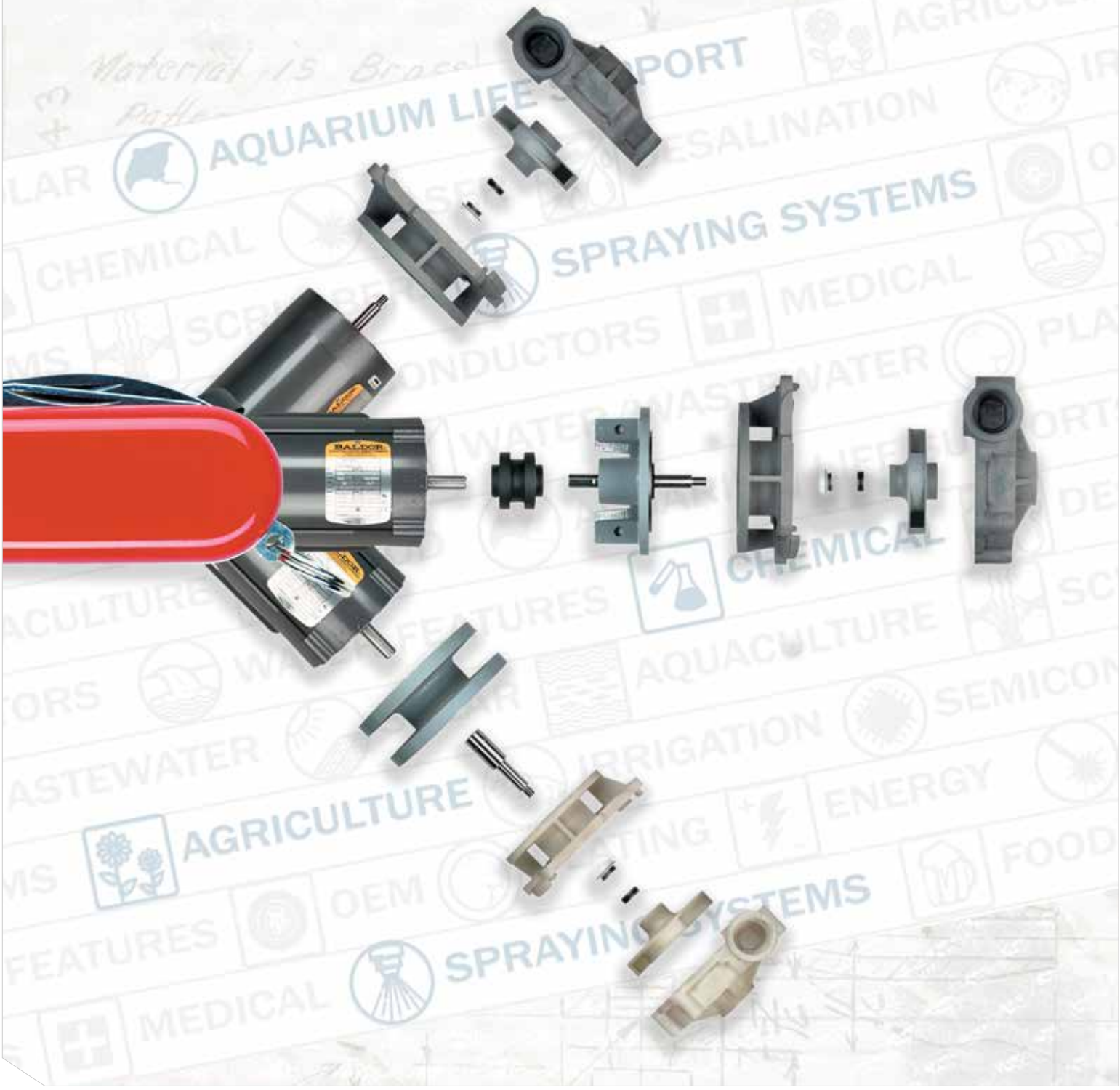
ADVANCE

1000 / 3000 / 4000

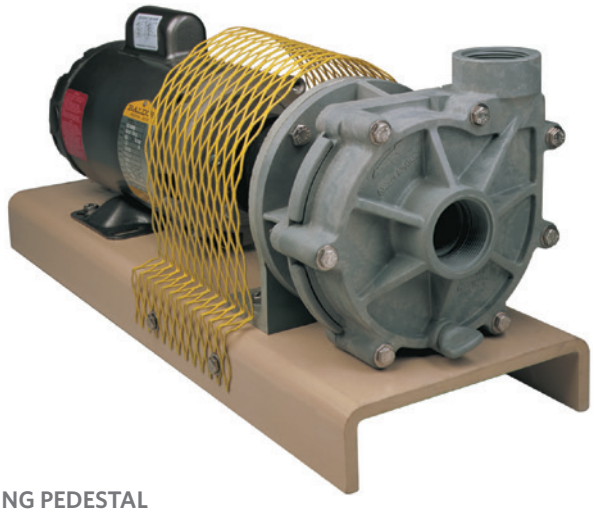
PRODUCT SPECIFICATIONS
PERFORMANCE CURVES
PRODUCT PHOTOS

Reliable, Corrosion Resistant Chemical Pumps



CLOSE-COUPLED AND EXTENSION BRACKET

Advance is designed to mount directly to NEMA 56J motors (C-face, threaded shaft), which are readily available in 1ø and 3ø, ODP, TEFC & TENV configurations. An extension bracket and 316 S.S. extension shaft are available to enable the use of a NEMA 56C motor (C-face, keyed shaft), which are also available in explosion-proof & chemical duty configurations.



BEARING PEDESTAL

A heavy-duty, bearing pedestal mount power frame is available for long coupling to a variety of motors, PTO, and engine drives.

DESIGN

Advance is molded out of high-quality glass-filled Noryl®, which gives it many advantages. It has good resistance to most acids, alkalis and inorganics. Noryl® has excellent tensile strength, very low water absorption, and a continuous temperature rating of 194° F.

We also offer the Advance line in polypropylene. The design of the pump, coupled with the chosen resins, produces a strong, durable, versatile unit. When used with the patented Impenatra® seal, the fluid pumped does not contact any metal parts. This allows it to properly handle many applications at a fraction of the cost of exotic alloys.

Engineered for high efficiency, Advance impellers are available as semi-open or enclosed to accommodate a wide variety of flows, pressures and fluids.

APPLICATIONS

Typical applications serviced by Advance include transfer of chemical process fluids, laser coolers, filtration systems, deionized water transfer, waste water reclamation, pressure spray systems, fountains, plating chemical transfer and recirculation, fume scrubbers, and pollution control equipment.

CORROSION RESISTANCE

Here is a small sampling of the chemicals handled:

- Sodium Hydroxide (10%)
- Ammonium Hydroxide (10%)
- Sodium Bicarbonate (SAT.)
- Ammonium Phosphate (SAT.)
- Potassium Bicarbonate (SAT.)
- Demineralized Water
- Ferric Chloride (SAT.)
- Ethylene Glycol
- Acetic Acid (10%)
- Nitric Acid (10%)
- Hydrochloric Acid (10%, 37%)
- Sulphuric Acid (10%, 60%)
- Nickel Plating Solutions

VERSATILITY

The pump can be close coupled to a 56J motor or mounted to a bearing pedestal. Both single and three phase motors in ODP and TEFC enclosures are readily available. An adapter kit is available to convert a 56C keyed-shaft motor to a 56J mount. A variety of elastomers, seals, impellers, and motors, can be combined to meet your exact requirements. All units are bench tested prior to shipping.

MARKETING

We are structured to sell unassembled pump ends, as well as completely assembled pump and motor units. We specialize in serving OEM's and distributors throughout the world.

IMPENATRA®

WHAT'S DIFFERENT ABOUT THE IMPENATRA®?

- A proven, balanced design approach which eliminates hang up.
- Seal case is precision-molded of chemical-resistant thermoplastic.
- All metal surfaces, springs and shafts are isolated from fluid contact.
- Easily handles a wide range of chemical solutions including most acids, bases and inorganics.
- Every seal is individually inspected to ensure consistent quality and is readily available.

A unique, patented design in mechanical seals is available from Advance. The Impenatra® seal is a radically new approach to solve many shaft sealing problems. When used with the Advance® line of pumps, it isolates all metallic parts from contact with the fluid.

Alternately, corrosive chemicals require seals made of exotic alloys. The high prices and long lead times are objectionable. The Impenatra® seal offers a solution to both problems.

WHAT THIS MEANS TO YOU.

- UNPRECEDENTED CORROSION RESISTANCE, protects from attack by contained fluid and from surrounding environment.
- Easy to install, field adjustment not required.
- Offers good versatility at an excellent price.
- Reliability, due to simplicity of design and quality components.

TECHNICAL DATA:

Seal Type - Stationary spring, reverse mount Maximum Temperature - 194°F

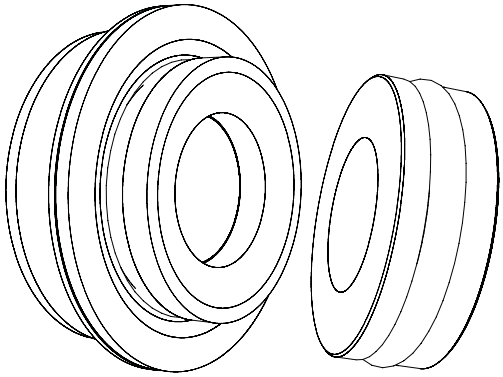
Materials of construction:

1. Seal case - injection molded polypropylene
2. Seal face - carbon graphite resin, binderless graphite or silicon carbide
3. Seal seat - high purity ceramic or silicon carbide
4. Elastomers - EPDM, Viton®, Kalrez® and Aflas®

EXAMPLE CORROSION RESISTANCE:

- Deionized Water
- Ferrous Chloride 100%
- Hydrochloric Acid 37%
- Hypo Acid Fixing Baths
- Nitric Acid 10%
- Phosphoric Acid
- Photographic Developers
- Plating Solutions
- Sodium Hydroxide
- Sodium Hypochlorite
- Sulfonic Acid (aerated)
- And much more...

IMPENATRA®



The Impenatra® is a non-metallic, reverse-mount 5/8" mechanical seal. It has a wide range of seal faces and elastomers to provide a broad range of chemical compatibility. The following application guide is presented as an aid in selecting the appropriate Impenatra® seal for your application. It is not to be considered complete, nor is it a guarantee of chemical compatibility or suitability.

The Impenatra® seal utilize the same polypropylene case and can be used in the Advance 1000 and 3000 models as well as other pumps based on the NEMA 56J reverse-mount type seal. Please contact the factory for more information.

MDM P/N	Code	Materials	Uses
1000.0421	E9-V-C	Carbon Graphite Head, Viton® Trim, Ceramic Mating Ring, Polypropylene Case	For most acids and inorganics. HCl 20% to 80F (26.7C); 37% to 110F (43C); H2SO4 98% to 140F (60C); FeCl3 to 86F (30C)
1000.0422	E9-E-C	Carbon Graphite Head, EPDM Trim, Ceramic Mating Ring, Polypropylene Case	For dilute caustic (Sodium Hydroxide NaOH) applications, KOH, Formaldehyde CH2O, alcohols and DI water.
1000.0423	E9-V-SC	Carbon Graphite Head, Viton® Trim, Silicon Carbide Mating Ring, Polypropylene Case	For Hydrofluoric Acid HF. FeCl3 to 86F (30C)
1000.0424	E9-E-SC	Carbon Graphite Head, EPDM Trim, Silicon Carbon Mating Ring, Polypropylene Case	For caustic solutions of high concentration or elevated temperatures. NaOH 45-50% to 86F (30C)
1000.0441	E43-V-C	Graphite Head, Viton® Trim, Ceramic Mating Ring, Polypropylene Case	For bleach solutions up to 14% Sodium Hypochlorite NaOCl to 86F (30C)
1000.0442	E43-E-C	Graphite Head, EPDM Trim, Ceramic Mating Ring, Polypropylene Case	For bleach solutions where caustic will contact seal.
1000.0443	E43-V-SC	Graphite Head, EPDM Trim, Silicon Carbon Mating Ring, Polypropylene Case	For acidic solutions that will attack carbon graphite and ceramic.
1000.0444	E43-E-SC	Graphite Head, Viton® Trim, Silicon Carbide Mating Ring, Polypropylene Case	For basic solutions that will attack carbon graphite and ceramic.
1000.0451	ESC-V-SC	Silicon Carbide Head, Viton® Trim, Silicon Carbide Mating Ring, Polypropylene Case	For applications that would normally attack the carbon graphite or ceramic parts, such as concentrated bleach, abrasive solutions or acidic solutions with crystalline solids
1000.0452	ESC-E-SC	Silicon Carbide Head, EPDM Trim, Silicon Carbide Mating Ring, Polypropylene Case	For bleach solutions where caustic will contact seal.

VARIABLE FREQUENCY DRIVE (VFD)

Advance pumps in combination with a variable frequency drive (VFD) result in a versatile pumping system with the lowest total cost of ownership. This is accomplished by slower operating speeds with a larger more efficient impeller, reducing energy consumption and increasing service life. Pump purchases should be seen as power and labor contracts, since operating cost will far exceed acquisition cost.

The design experts at MDM will size the pump to meet maximum system flow and validate whether a VFD is appropriate for your pumping application. Below is a list of potential operating benefits.

Aegis ground rings and insulated bearings can be provided for additional protection for VFD applications.

BENEFITS

- Reducing rotational speed will draw less electrical power compared to valve throttling.
- Increased service life by lowering rotational speed (seals, bearings and motor).
- Ability to integrate with system automation and monitoring. Rotational speed can be controlled to maintain a desired flowrate as system pressure demands fluctuate.
- Inherent soft starting reduces wear on motor and other system components such as piping and valves.
- Voltage being supplied to the motor is optimized based on the operating load, thus maintaining the right amount of motor slip.
- Some utilities offer rebates for installing VFDs in new or retrofit work.

PURFLO BASKET STRAINER - 500 CUBIC INCH

Our heavy duty PurFlo strainer comes in a standard one-high unit with a clear or gray PVC body and a basket made of stainless steel or acrylonitrile butadiene styrene (ABS). The standard port dimension is 2'' with a female thread. With PurFlo you can expect higher quality modling processing, finer materials and excellent performance.

SIZE	BODY COLOR	PART NUMBER	O-RINGS	MATERIAL
2"	Clear	24170488	Buna	PVC / ABS / SS
2"	Gray	24170496	Buna	PVC / ABS / SS

ADVANCE 2020 PUMP OPTIONS (60 HZ)

MDM PUMP	ADVANCE 1000	ADVANCE 3000	ADVANCE 4000
ALLOWABLE FLOWRATE RANGE (GPM) [1]	5 - 135	10 - 70	15 - 185
ALLOWABLE PRESSURE RANGE (FT) [1]	5 - 85	5 - 155	10 -80
MAXIMUM EFFICIENCY	67%	56%	75%
MOTOR POWER (HP)	1/2 - 5	1/2 - 5	1/2 - 5
POWER OPTIONS (VOLTAGE / PHASE)	110-220V / 1ø *or* 230-460V / 3ø	110-220V / 1ø *or* 230-460V / 3ø	110-220V / 1ø *or* 230-460V / 3ø
NEMA MOTOR FRAME [2]	56J (OR) 56C	56J (OR) 56C	56J (OR) 56C
PUMP WET END MATERIAL	Noryl® *or* Polypropylene	Noryl® *or* Polypropylene	Polypropylene
MECHANICAL SEAL	Impenatra I (Non Metallic)	Impenatra I (Non Metallic)	Impenatra I (Non Metallic)
IMPELLER TYPE	Enlosed	Enlosed	Enlosed
IMPELLER MATERIAL	Noryl®	Noryl®	Noryl®

1) Allowable Operating Range (AOR) is between 50% & 140% of Best Efficiency Point (BEP).
2) Close Coupled or Pedestal Mounted.

ADVANCE® PUMPS

Part Numbering System

To determine a part number, select the appropriate number from the categories listed below and insert them into the corresponding digits.
For example: 1344.212 would be a Noryl® Advance 1000 with #3 enclosed impeller, 1HP, 2 Pole, 3 Phase TEFC motor, fitted with an Impenatra® E9-V-C seal and SS hardware. The pump end for same would be 1300.212 and a pedestal mounted pump (no motor or base) would be 1306.212.

1st Digit	2nd Digit	3rd Digit	4th Digit.	5th & 6th Digit	7th Digit	8th Digit	9th Digit	10th Digit
Pump Material	**Impeller Type**	**Motor HP**	**Motor Type**	**Mechanical Seal**	**Hardware**	**Motor Modifiers**	**Mounting Types**	**Motor Make & Cord**

1ST DIGIT - PUMP MATERIAL
1 = Model 1000, Noryl®
2 = Model 1000, Polypropylene
3 = Model 3000, Noryl®
4 = Model 4000, Polypropylene

2ND DIGIT - IMPELLER
1 = #1 Enclosed Impeller
2 = #2 Enclosed Impeller
2s = #2s Semi-Open Impeller
3 = #3 Enclosed Impeller
3s = #3s Semi-Open Impeller
4 = #4 Enclosed Impeller
4s = #4s Semi-Open Impeller
5 = #5 Enclosed Impeller
5s = #5s Semi-Open Impeller
6 = #6 Enclosed Impeller
6s = #6s Semi-Open Impeller
7 = #7 Enclosed Impeller
8 = #8 Enclosed Impeller (4000 only)
8s = #8 Semi-open Impeller (4000 only)
9 = Special (Refer to Factory)
Add a "T" after # for a special trim and specify the impeller diameter

3RD DIGIT - MOTOR HORSEPOWER
0 = Pump End (if 4th digit is also 0 or pedestal unit (w/out motor)
1 = ⅓ HP 2 Pole
2 = ½ HP 2 Pole
3 = ¾ HP 2 Pole
4 = 1 HP 2 Pole
5 = 1 ½ HP 2 Pole
6 = 2 HP 2 Pole
7 = 3 HP 2 Pole
8 = 5 HP 2 Pole
9 = Special
B = 7 ½ HP 2 Pole
C = 10 HP 2 Pole
D = 15 HP 2 Pole
E = 20 HP 2 Pole
H = ⅛ HP 4 Pole
J = ⅙ HP 4 Pole
K = ¼ HP 4 Pole
L = ⅓ HP 4 Pole
M = ½ HP 4 Pole
N = ¾ HP 4 Pole
P = 1 HP 4 Pole
Q = 1 ½ HP 4 Pole
R = 2 HP 4 Pole
S = 3 HP 4 Pole

4TH DIGIT - MOTOR TYPE
0 = Pump End
1 = 1 Phase ODP
2 = 3 Phase ODP
3 = 1 Phase TEFC
4 = 3 Phase TEFC
5 = DC
6 = Pedestal Mtd. Pump End (without motor)
7 = Air Motor
9 = Special Motor
E = 1 Phase Exp. Proof
F = 3 Phase Exp. Proof
G = 1 Phase Dirty Duty
H = 3 Phase Dirty Duty
J = 1 Phase Wash Down
K = 3 Phase Wash Down

5TH & 6TH DIGIT - SEAL
11 = 18-8 Stainless Steel Buna
12 = 18-8 Stainless Steel Viton®
13 = 18-8 Stainless Steel with Food Grade Buna
14 = 316 Stainless Steel Buna
15 = Dry Run Brass with Buna
16 = 316SS, Buna, Carbon vs Silicon Carbide
21 = Impenatra® E9-V-C, Carbon Graphite (CG) on Ceramic with Viton® Trim
22 = Impenatra® E9-E-C, Carbon Graphite (CG) on Ceramic with EPDM Trim
23 = Impenatra® E9-V-SC, CG on Silicon Carbide with Viton® Trim
24 = Impenatra® E9-E-SC, CG on Silicon Carbide with EPDM Trim
41 = Impenatra® E43-V-C, Graphite on Ceramic with Viton® Trim
42 = Impenatra® E43-E-C, Graphite on Ceramic with EPDM Trim
43 = Impenatra® E43-V-SC, Graphite on Silicon Carbide with Viton® Trim
44 = Impenatra® E43-E-SC, Graphite on Silicon Carbide with EPMD trim.
51 = Impenatra® ESC-V-SC, Silicon Carbide on Silicon Carbide with Viton® Trim
52 = Impenatra® ESC-E-SC, Silicon Carbide on Silicon Carbide with EPDM Trim

7TH DIGIT - HARDWARE
2 = Stainless Steel
3 = Titanium

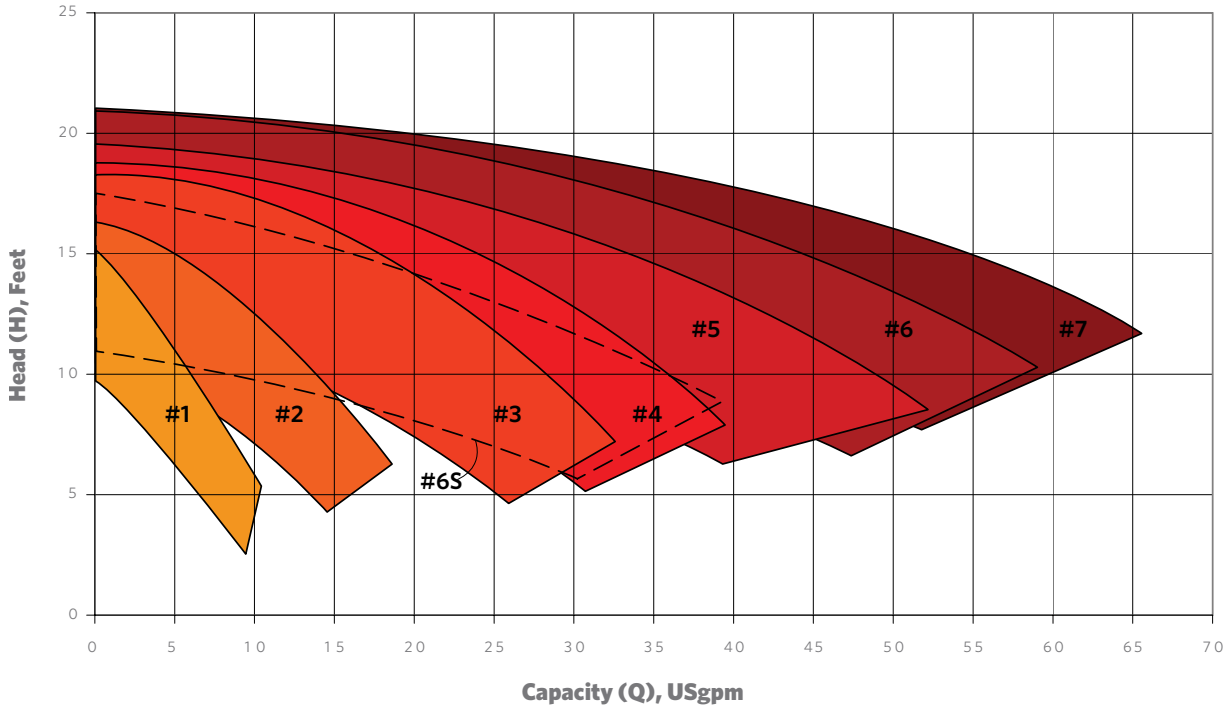
8TH DIGIT - MOTOR MODIFIER*
B = 50/60Hz.
C = 60Hz. derated to 50 Hz. with sticker
D = 50Hz. Only
G = 48 Frame Metal Base
H = 56 Frame Metal Base
I = Install Seal in Pump End
J = 60Hz., Class F Ins., 575V
N = 50Hz., Class F Ins., 380V
O = 60Hz., Class F Ins., 230/460V
P = 50Hz., Class F Ins., 415V
Q = 60Hz., Class F Ins., 115V
S = Custom Motor
U = 50Hz., 110/220V
V = 50Hz., 220/380V
W = 56C Face Motor
X = Ignore
Y = Standard Closed Face Motor on Base with Coupling and Guard

9TH DIGIT - MOUNTING TYPE
A = Ext. Bracket with ⅝" SS Shaft
B = Ext. Bracket with ⅞" SS Shaft
D = Pedestal Mounted Pump End
E = European Extension Bracket and Shaft
L = Thread Lock Impeller
P = Protective Shaft Coating
T = Two Speed Motor and Switch
X = Ignore

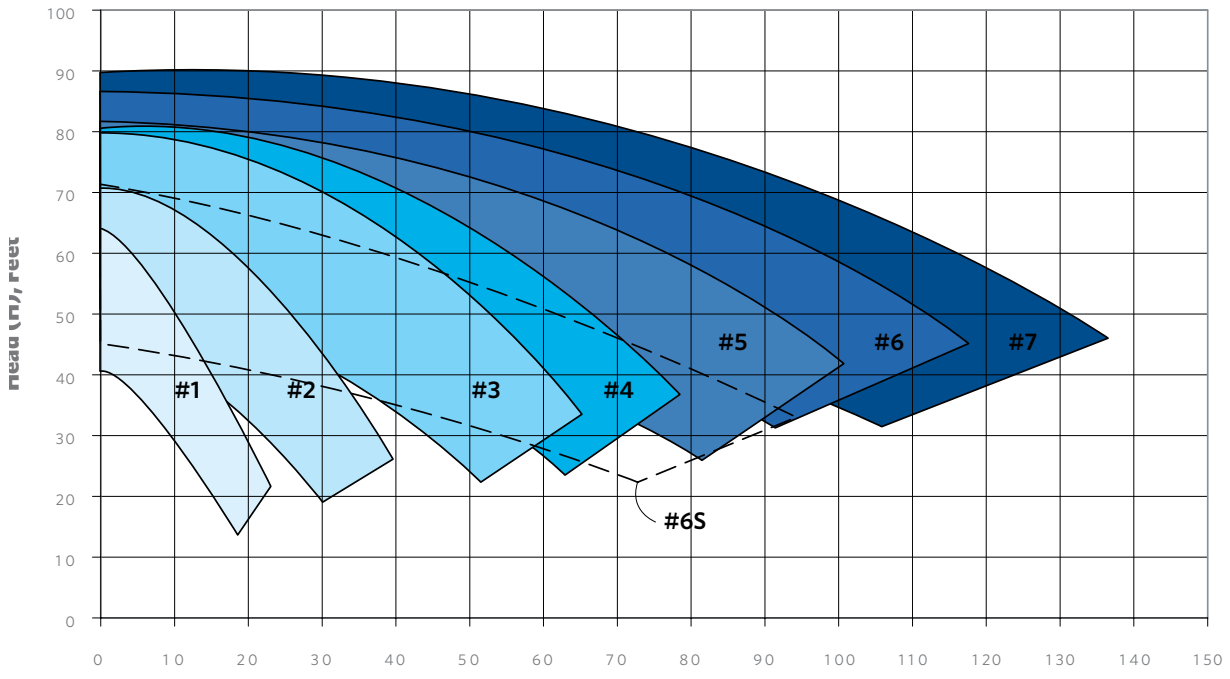
10TH DIGIT - MOTOR MAKE AND CORD
1 = 8 Ft. of Cord with 115V Plug
2 = 8 Ft. of Cord with 230V Plug
B = Baldor Industrial Motor
C = A.O. Smith / Magnetek / Century
D = Baldor Commercial Motor
F = Franklin
G = General Electric
L = Leeson
M = Marathon
O = Loher
R = Reliance
T = Toshiba
U = U.S. Motor
W = WEG
X = Ignore

*The last 3 digits are used if you have a custom motor, cord, extension bracket, base mounted unit or special adder.

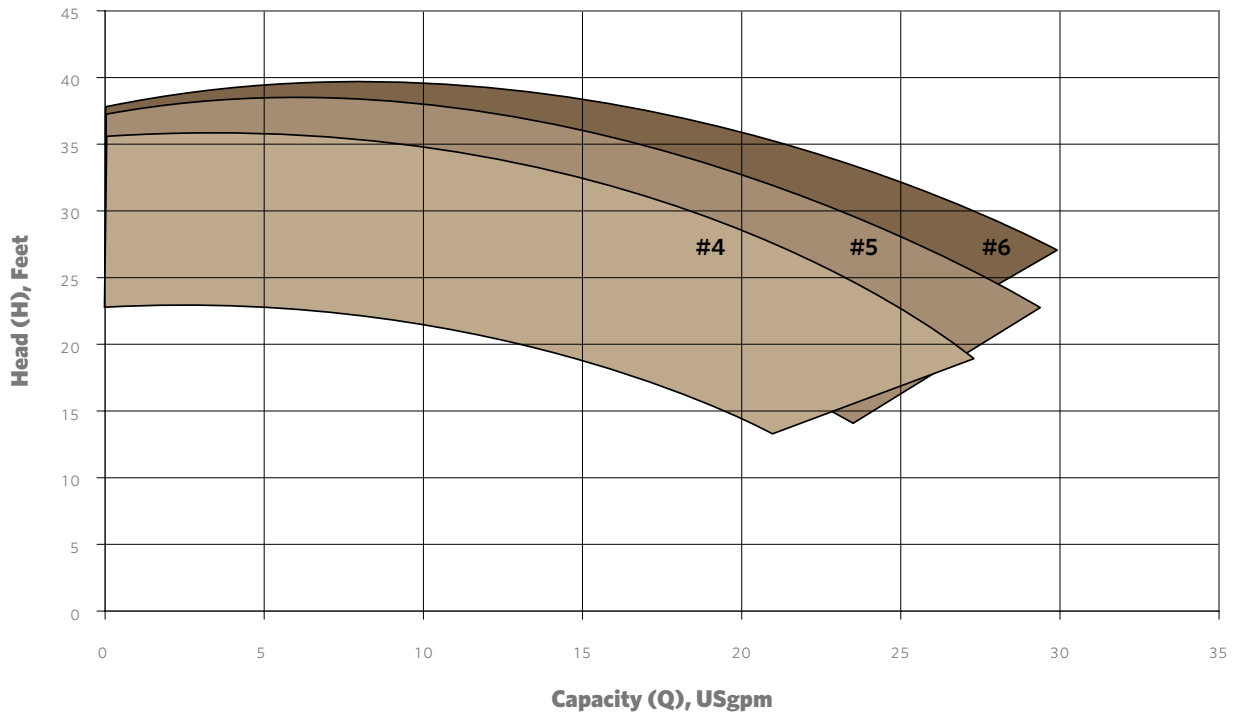
1725 rpm



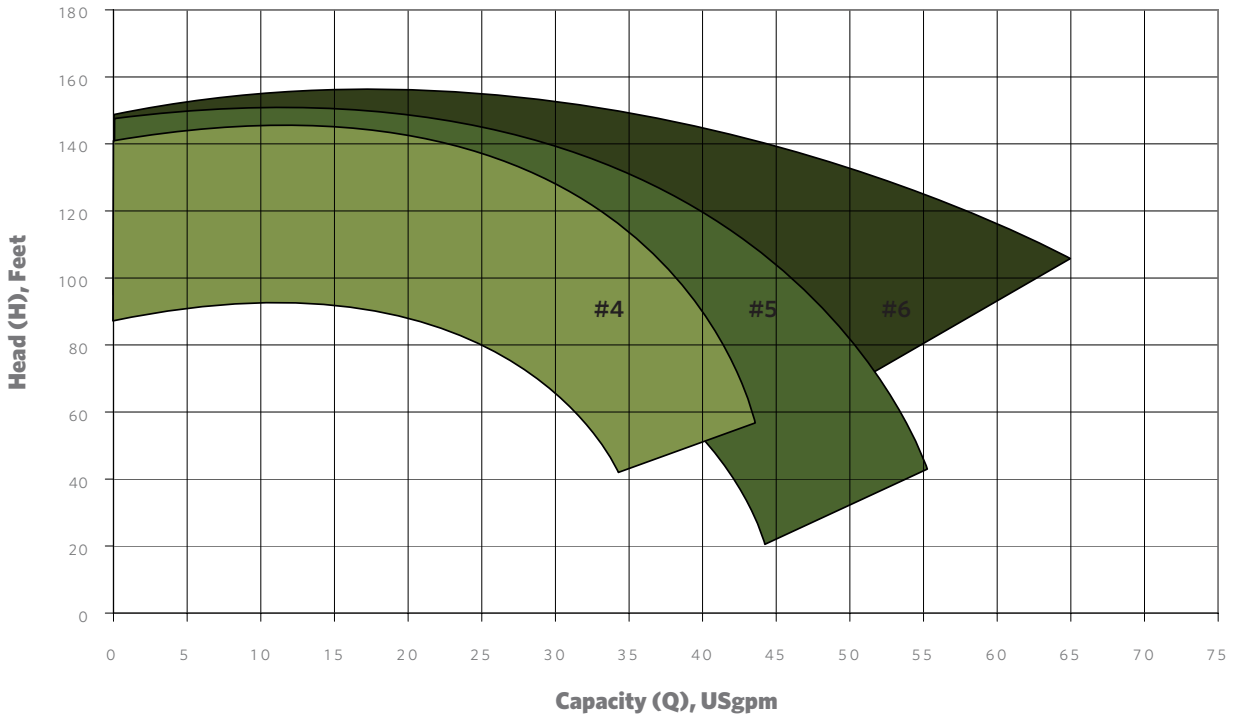
3450 rpm

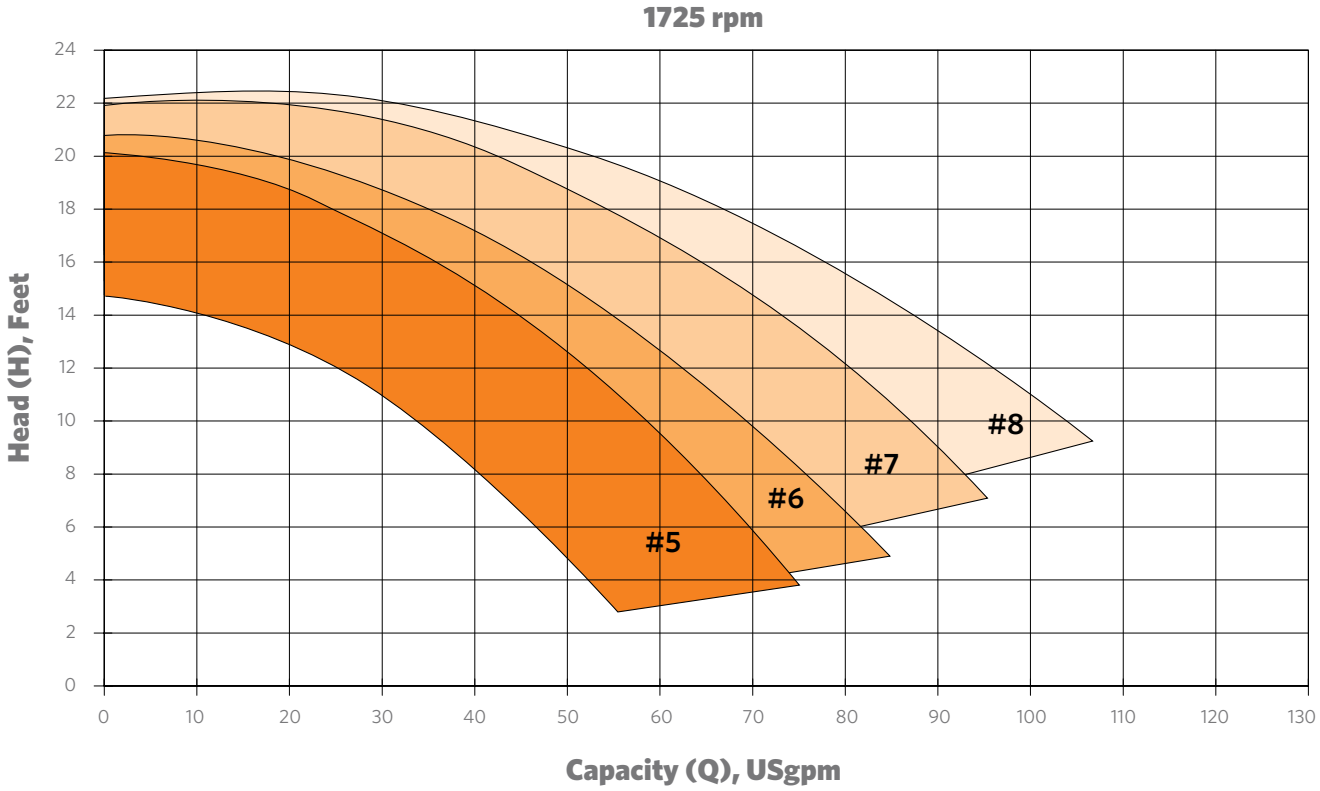


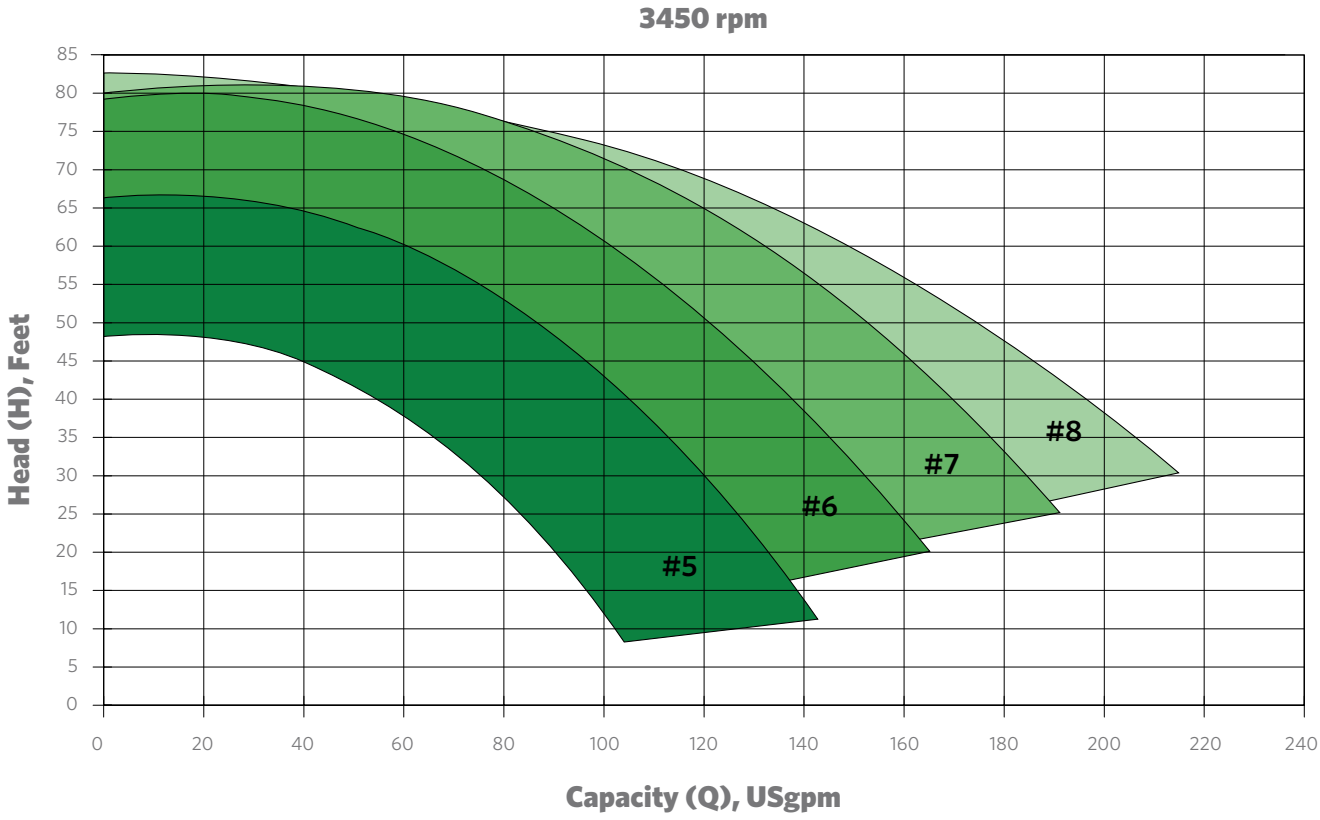
1725 rpm



3450 rpm




1725 rpm
Head (H), Feet
Capacity (Q), USgpm
#5
#6
#7
#8
0
2
4
6
8
10
12
14
16
18
20
22
24
0
10
20
30
40
50
60
70
80
90
100
110
120
130


3450 rpm
Head (H), Feet
Capacity (Q), USgpm
#5
#6
#7
#8
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
0
20
40
60
80
100
120
140
160
180
200
220
240