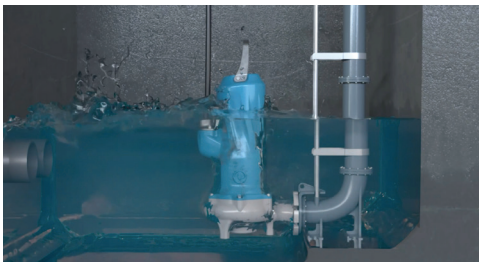
CRANE
PUMPS & SYSTEMS

SyFlo VALUE SHEET

- SUPERIOR SOLIDS HANDLING
- OPTIMIZED HYDRAULIC EFFICIENCY
- INCREASED PERFORMANCE COVERAGE
- SHALLOWER LIFT STATIONS
- EASE OF INSTALLATION
- SUPERIOR RELIABILITY
- LOWER ENERGY COSTS
- DESIGNED & BUILT IN USA



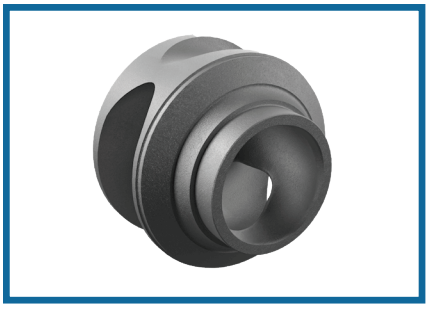
BARNES®

SUPERIOR SOLIDS HANDLING PERFORMANCE

SyFlo's greatest innovation is with the new hydraulics, optimized for excellent solids handling—**solving clogging problems and saving on operating and maintenance costs.**

Scroll Impeller

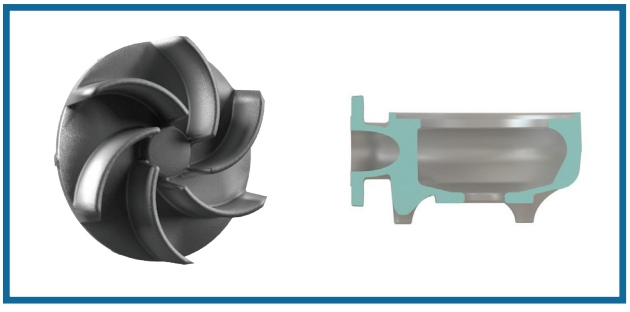
- Prioritizes passing solids with large, smooth flow passages
- One or two vanes
- Cavitation characteristics similar to a traditional enclosed impeller
- ASTM A48 Class 30 Cast Iron Standard, ASTM A532 Class III Type A White Iron Optional



When to use the Scroll: Scroll impellers tend to have flatter curves, with lower shutoff heads and higher run out flows. Use when an application calls for more flow, and has a higher solids load

Vortex Impeller

- Tall impeller vanes and smoothed volutes maintain excellent solids handling of a typical vortex, but with increased efficiency
- Steep characteristics curves are ideal for challenging design points
- ASTM A532 Class III Type A White Iron Standard, for increased abrasion resistance



When to use the Vortex: Vortex curves are steep, providing high head, low flow offering. Vortex impellers are also more forgiving to running at the extreme left and right on the curve, so utilize for tougher design points. Utilize vortex for moderate solids loads.

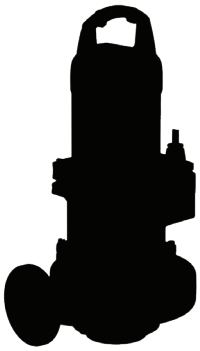
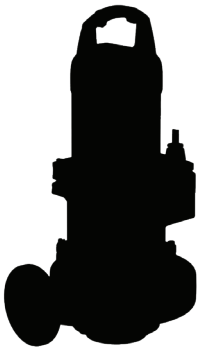
Comparison of Clog Test Results

To ensure that SyFlo has superior solids handling capability, a standardized "non-clog test" was developed. See how the different SyFlo designs handle difficult solids that you may see in your waste stream.

	Impeller Options	
	Scroll	Vortex
  1 Baby Wipe, Plastic Grocery Bag	✓	✓
  Soda Can, Tennis Ball	✓	✓
  Ball of Wipes, Shop Rag	✓	✓
  Cotton Underwear, Knotted Cord	✓	✓
  Pillow Case, Scarf	✓	✓
  Plastic Table Cloth, Inflatable Pool Toy	✓	X

OPTIMIZED HYDRAULIC EFFICIENCY

Not only do SyFlo's new hydraulics provide optimized solids handling, it also provides maximum wet end efficiency. **This means the SyFlo can deliver the same performance you need at an equal or lower horsepower than the alternative, saving on initial and operating costs.**

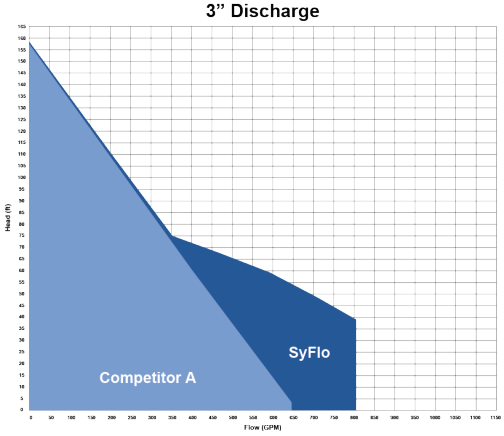
Competitor	Legacy Crossover	SyFlo Crossover
Competitor A  **7.5 HP** Efficiency = 66%	BARNES® SH  **10 HP** Efficiency = 62%	SyFlo BY BARNES®  **7.5 HP** Efficiency = 71%
Competitor B  **7.5 HP** Efficiency = 56%	BARNES® SH  **15 HP** Efficiency = 27%	SyFlo BY BARNES®  **7.5 HP** Efficiency = 56%

INCREASED PERFORMANCE COVERAGE

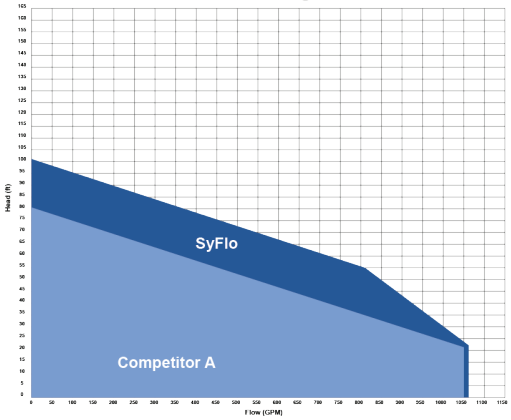
The SyFlo is designed to provide best in class hydraulic coverage versus other manufacturers in the market. **For a given discharge and motor configuration, the SyFlo performance will match or surpass the competition.**

SyFlo Scroll & Vortex vs. Competitor A

3" Discharge

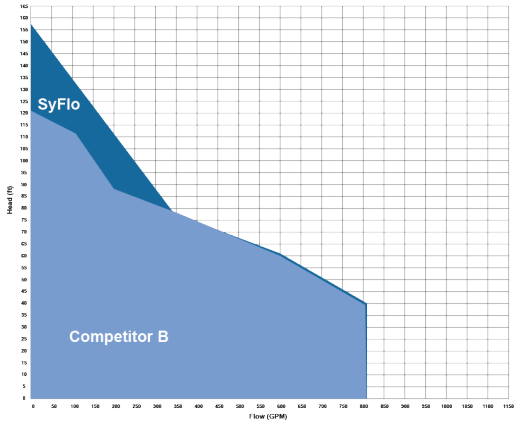


4" Discharge

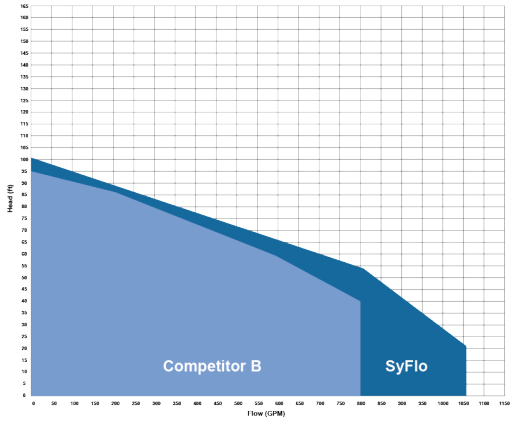


SyFlo Scroll & Vortex vs. Competitor B

3" Discharge

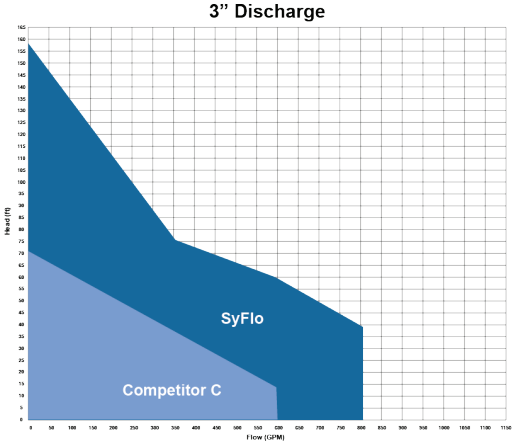


4" Discharge

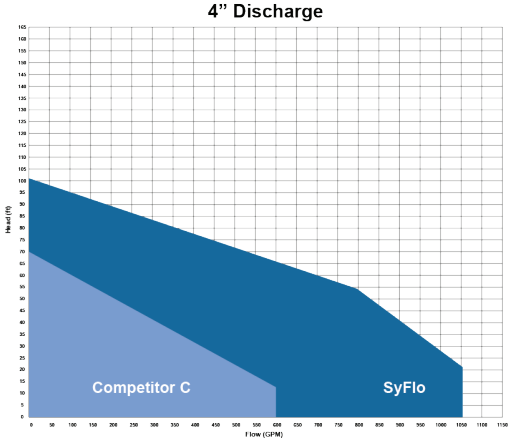


SyFlo Scroll & Vortex vs. Competitor C

3" Discharge



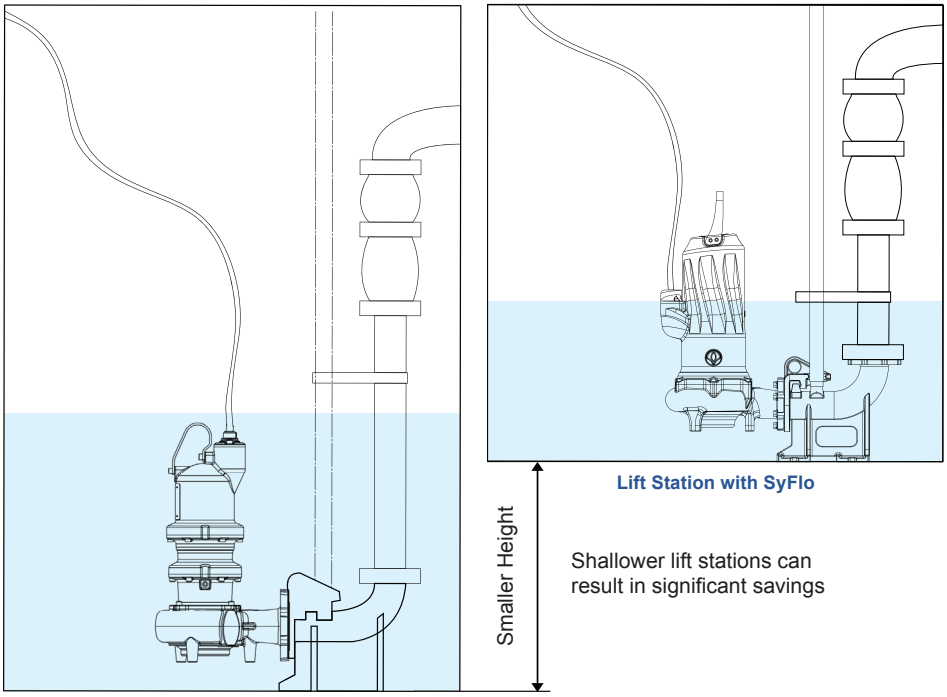
4" Discharge



SHALLOWER LIFT STATION

Utilizing an IE3 Rated Air Filled Premium Efficient motor, the SyFlo can operate continuously with the motor partially submerged, unlike most oil filled submersible motors. This allows the operating volume to be positioned lower in the wet well. **In new stations, SyFlo allows for shallower lift stations, which reduces equipment, material, and installation costs. For aftermarket replacements, it allows for an increased holding volume in the existing wet well, enhancing the station's flexibility in sewage management.**

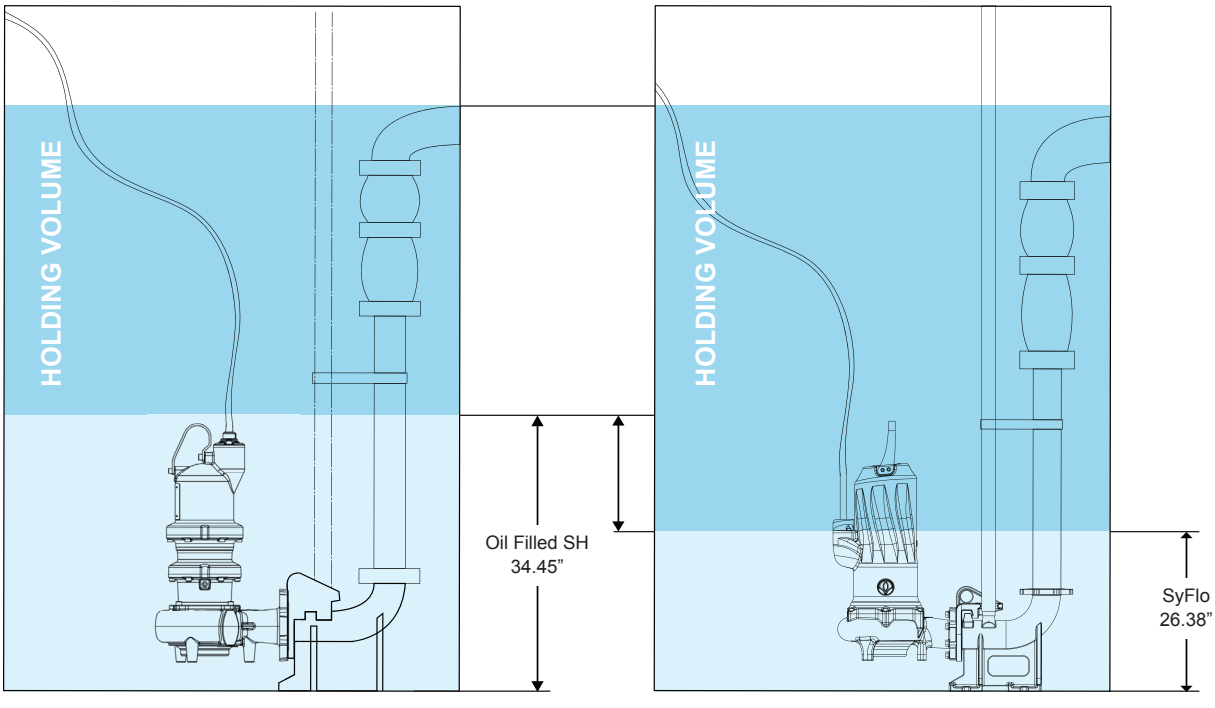
New Lift Station



Lift Station with SyFlo

Lift Station with oil filled Submersible Motor

Existing Lift Station



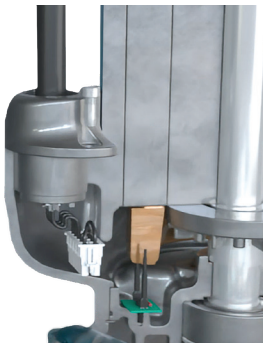
Lift Station with oil filled Submersible Motor

Lift Station with SyFlo

EASE OF INSTALLATION

Cords

SyFlo features a single alignment quick disconnect cord, which includes both the power and sensing leads in one cable. While SyFlo pumps and cords will be paired, the cord can be easily disconnected during service and maintenance.



SyFlo

"Quick Connect" Cord

Easy Removal? ✓

Retrofitting & Adaptability

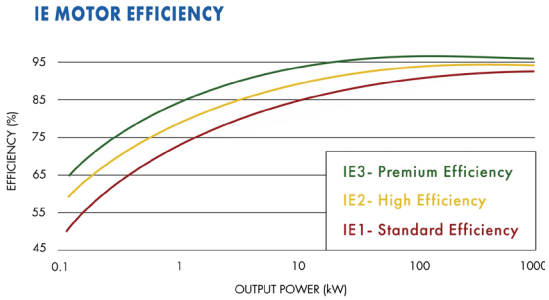
The configuration flexibility of the SyFlo, combined with the slotted ANSI flange that can adapt to DN and ISO flanges, and the wide variety of mounting accessories, allows it to be easily installed and retrofitted into almost any application.

PRODUCT RELIABILITY

The IE3 rated premium efficiency air filled motor featured on the SyFlo will last longer than the standard efficiency alternative, due to a variety of factors:

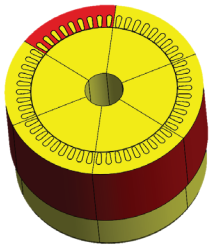
IE3 Rated Premium Efficient Motors

A more efficient motor will convert more input energy into pumping energy, and so less is lost as heat. Cooler running motors have longer lifespans, reducing the need to maintenance or replacement.



Class H Insulation

Stator windings can run up to 180°C while most competitors can only take 155 °C. The higher class of insulation the more protection for your motor. Class H is the highest classification in the market today.



PRODUCT RELIABILITY

Permanently Lubricated Bearings

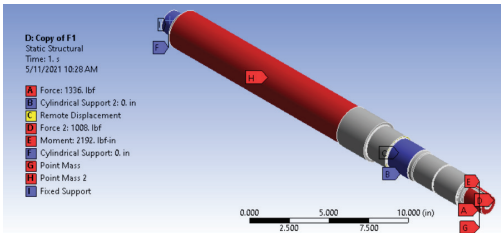
High capacity bearings have a longer L10 Bearing Life, which leads to more time between failures and less overall maintenance. You also don't have to have any external lubrication reducing labor costs. Your associates won't have to spend time lubricating bearings annually.

Single Piece Motor Housing

SyFlo features a new single piece motor housing that reduces the number of joints throughout the pump, down to two, highlighted here. This lowers the potential leak paths to the motor, and thus reduces the likelihood of the motor failing due to water damage – increasing protection and equipment up time.

More Robust Shaft

This shaft has a shorter overhang than the comparable oil filled shaft leading to less stress on the shaft for a given radial load. Having a more robust and durable shaft prolongs the pump life by minimizing deflection at the seals and wear rings.



Impeller Options

SyFlo impellers are available in ASTM A532 Class III Type A White Iron – optional for scroll impellers and standard on vortex impellers.

Longer Impeller Life & Lower Cost

- Impeller hardness of 58 HRC, greater than most solids in waste stream
- Designed to pump and chop hard solids within the waste stream including abrasive substances like sand and grit
- Made to outlast standard Cast Iron impellers by more than 3 times

Sustained Non-Clogging And Hydraulic Performance

- Resistant to abrasion and chips
- Impeller vanes remain in pristine condition even after pumping and chopping the most difficult solids
- Provide sustained non-clogging and hydraulic performance over a prolonged period of time

Consistent Higher Pump Efficiencies

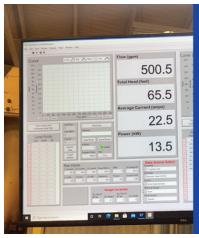
- Nickle hardened material provides higher hydraulic efficiencies over longer periods of time while reducing energy and operating costs

ENERGY COST SAVINGS

Engineers: Standard oil filled motor efficiency is significantly lower than IE3 air filled efficiency, resulting in annual energy cost savings when switching from oil to air filled. Your pump could pay for itself in 3 years with the money you save in energy costs!

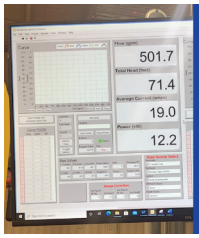
WATCH AN EFFICIENCY DEMO COMPARING OIL TO AIR FILLED PUMPS: youtube.com/watch?v=MVZdh5CxWwQ

Aftermarket: The First Law of Thermodynamics, also called the Law of Conservation of Energy, states that energy cannot be created or destroyed – it only can change forms. The input electrical energy can either be converted to mechanical energy (i.e. to drive the shaft) or heat (i.e. losses). The less energy that is converted into heat, the more that is converted into pump energy.



OIL FILLED Reading

Flow: 500.5 GPM
Head: 65.5 ft
Average Current: 22.5 amps



SyFlo Reading

Flow: 501.7 GPM
Head: 71.4 ft
Average Current: 19.0 amps

Competitor		
Amperage	22.5	amps
Voltage	460	volts
Power Factor	73.3	%
Hours/Day	10	
Days/Year	365	
$/kwh	0.12	
Annual Energy Cost	$ 5,755	

SyFlo		
Amperage	19.0	amps
Voltage	460	volts
Power Factor	78.5	%
Hours/Day	10	
Days/Year	365	
$/kwh	0.12	
Annual Energy Cost	$ 5,205	

By switching to the envie3, the customer can save $551 annually!

Over the 5 Year Limited Warranty, this will save the customer $2,755!

Annual Energy cost can be calculated with the below equations (using amps or by flow). Resources are available to automatically calculate this for you.

Energy Cost equation using Amps:

$$Annual\ Energy\ Cost\ \left(\$/_{yr}\right) = \left[\frac{I*V*PF*\sqrt{3}}{1000}\right] * \frac{X\ hours}{1\ Day} * \frac{365\ days}{1\ Year} * \frac{\$X}{kWh}$$

Energy Cost equation using Flow:

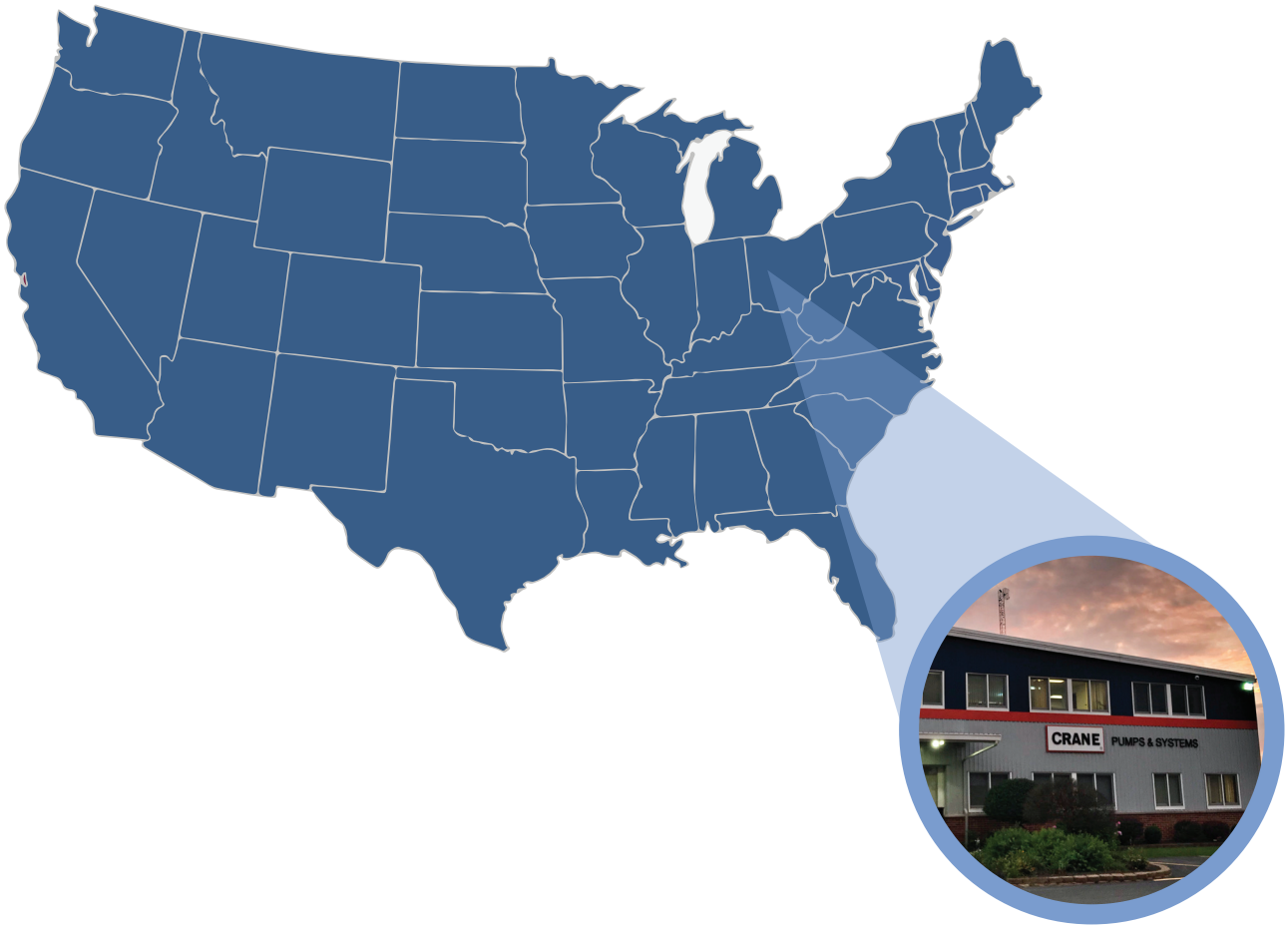
$$Annual\ Energy\ Cost\ \left(\$/_{yr}\right) = \left[\frac{Flow*Head}{3960*Wire\ to\ Water\ Efficiency}\right] * \frac{0.7457kW}{HP} * \frac{X\ hours}{1\ Day} * \frac{365\ days}{1\ Year} * \frac{\$X}{kWh}$$

The below table compares the Full Load Amps between a CP&S Oil Filled Motor, the envie³, and two competitors.
When you're unable to perform a calculation, this can help reinforce the efficiency differences.

Motor	Oil Filled Full Load Amps	SyFlo Full Load Amps	Competitor A Full Load Amps	Competitor B Full Load Amps
15HP, 1750RPM, 460V	23.4	19.2	N/A	19.0
15HP, 1750RPM, 230V	46.9	38.0	N/A	38.0
10HP, 1750RPM, 460V	14.9	12.8	13.0	12.5
10HP, 1750RPM, 230V	29.8	25.6	25.0	25.0
7.5HP, 1750RPM, 460V	11.9	9.7	10.0	9.2
7.5HP, 1750RPM, 230V	23.7	18.7	19.0	18.4

BUILT IN AMERICA

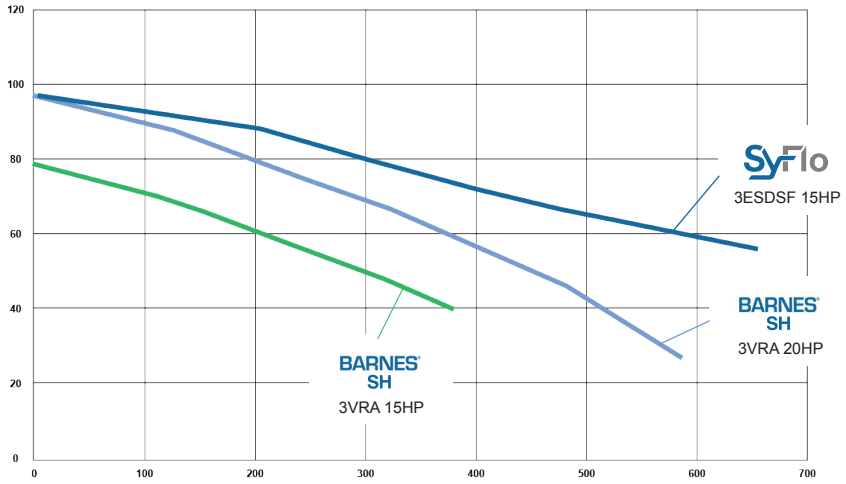
SyFlo Pumps are designed, assembled, and tested in our facility in Piqua, OH. **Not only does this mean lower lead times than pumps built internationally, but it also means the SyFlo is backed with American quality and workmanship.**



POSITIONING

While SyFlo covers a unique segment of the wastewater pump market, it also overlaps with our existing product lines. Because of this overlap, we've developed a set of guidelines of when to use which of our products: the envie[3] solids handling and chopper, the SyFlo, our oil filled chopper, and our legacy solids handling products.

	SyFlo	SH (Oil-Filled Solids Handling)	SITHE (Oil-Filled Chopper)	SH envie[3] (envie[3] Solids Handling)	SITHE envie[3] (envie[3] Chopper)
Max Curve Performance (Flow)	Up to 1,050 GPM	Up to 5,800 GPM	Up to 4,600 GPM	Up to 8,800 GPM	Up to 4,600 GPM
Max Curve Performance (Head)	Up to160'	Up to 310'	Up to 275'	Up to 260'	Up to 275'
Ideal Flow Range	50 – 1,050 GPM	50 – 5,800 GPM	200 – 4,600 GPM	50 – 8,800 GPM	200 – 4,600 GPM
Solids Handling Performance	Medium	Low to Medium	High	Low to Medium	High
Hydraulic Efficiency	High	Low to Medium	Medium	Low to Medium	Medium
Minimum Submergence Requirement	Cord Entry	Entire Pump	Entire Pump	Top of the Volute	Top of the Volute
Motor Efficiency Rating	IE3	IE0	IE0	IE3	IE3
Dry Run Option	No	No	No	Yes	Yes



The included curve compares the SyFlo 3ESDSF 15HP to the Barnes 3SHVRA 15HP and 20HP performance curves. Not only does the SyFlo deliver superior performance, it also can pass a 3" spherical solid when the legacy product cannot.

WHAT DOES "SYFLO" MEAN?

Sy: **Sy**nthesis
pronounced "sigh"

Flo: **Flo**w
pronounced "flow"

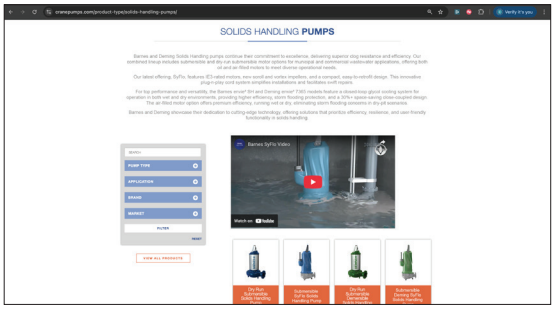
Synergy and Efficiency in Solids Handling

1. Extension of the "y" re-enforces the aspect of flow and water movement
2. Combination of the "y" into the "F" represents the combination of ideas to create a new whole (i.e. synthesis)
3. The sharp cuts and angles represent hydraulic efficiency and solids handling capabilities

AVAILABLE RESOURCES

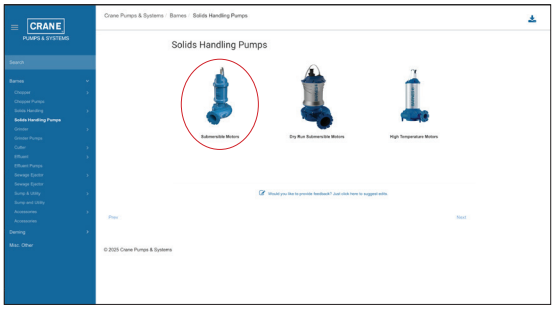
Crane Pumps & Systems Website:

Our general CP&S website (www.cranepumps.com) is a great place to look for product and application information. The site gives general information about the features and benefits of the pumps and detailed product descriptions about our entire solids handling portfolio.



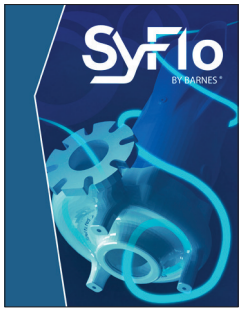
Technical Documents:

Our product catalogs are your one-stop shop for comprehensive technical information on our engineered products. To find the SyFlo Series, navigate through the catalog website by clicking on: Barnes/ Solids Handling/ Submersible Motors/SyFlo Series.



Sales Documents:

Explore our SyFlo product line with our high-level overview Sales Sheet, or dive deeper with our detailed 6-page Brochure. Printed copies and PDF downloads are available on the Marketing Portal. A button to this portal can be found on your CP&S Connect home screen in the bottom right corner. Look for the words "Marketing Portal."



Tradeshow Resources:

Our Regional Sales Managers are equipped with versatile SyFlo commercialization kits, ideal for demonstrations and tradeshows. Contact your RSM for more information and to enhance your upcoming event.

CRANE®

PUMPS & SYSTEMS

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