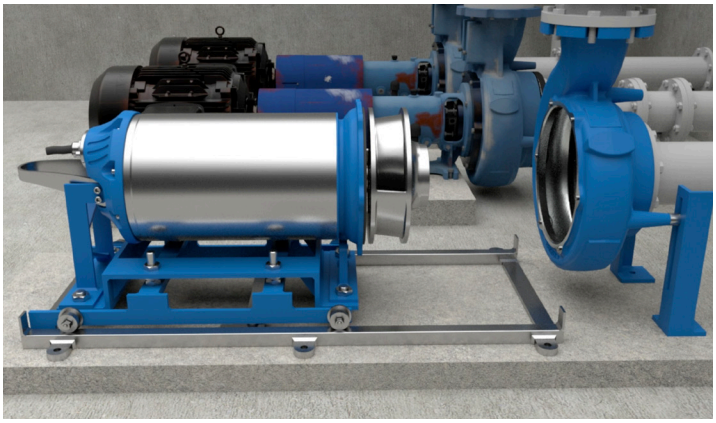
CRANE PUMPS & SYSTEMS

BUILT IN USA

envie³ VALUE SHEET

- LOWER MINIMUM SUBMERGENCE
- LONGER MOTOR LIFE
- EASY INSTALL
- 5 YEAR LIMITED WARRANTY
- PREMIUM MOTOR EFFICIENCY
- CHOPPER AND NON-CLOG
- FLOOD PROOF



Check out the envie³ Launch Video

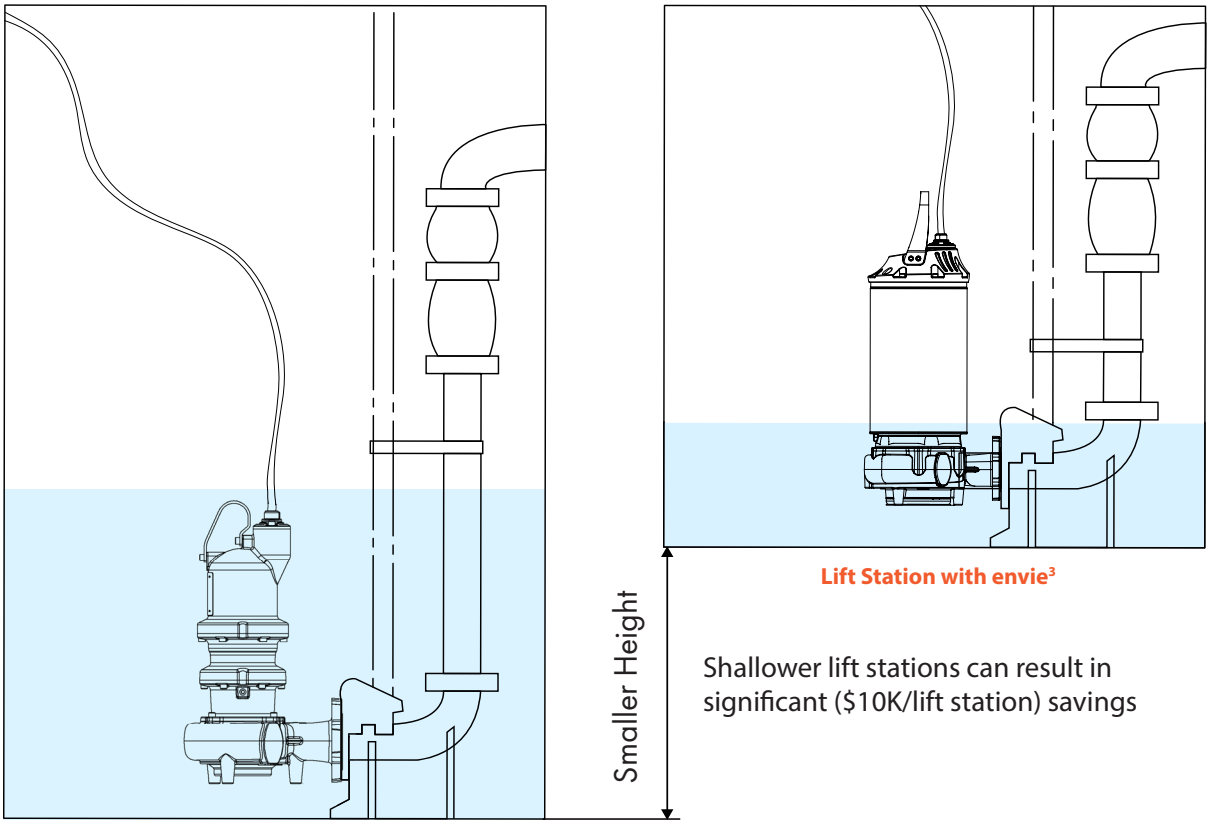
BARNES® DEMING®

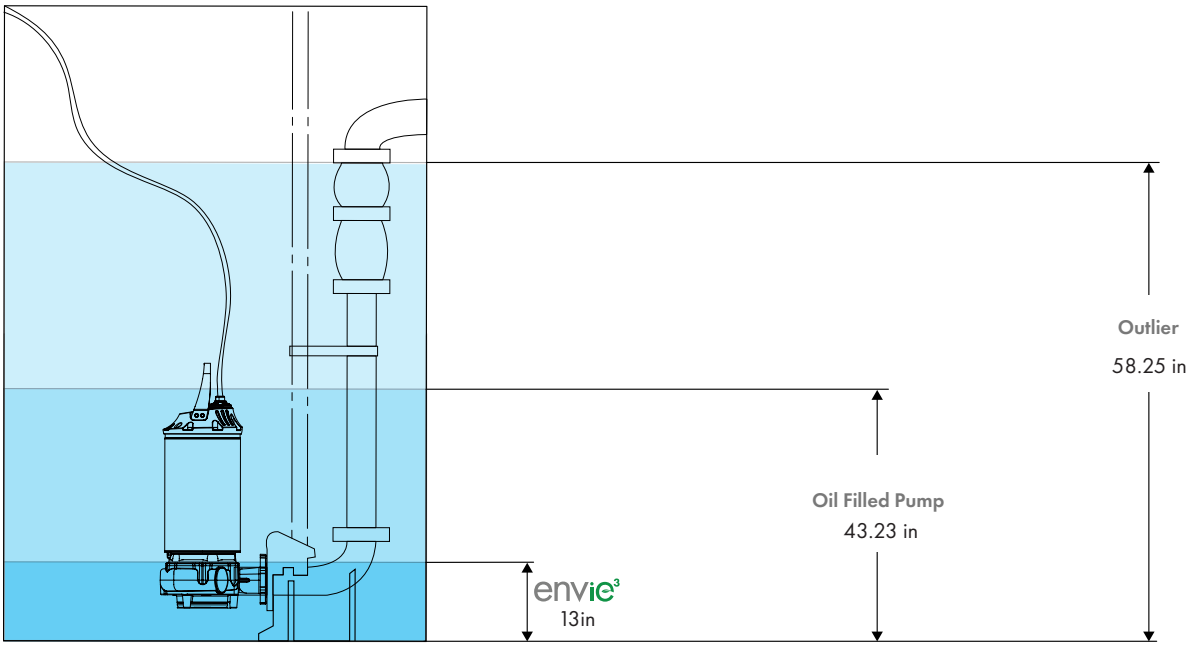
Minimum Submergence

The lower continuous minimum submergence requirement of the envie3 benefits both new lift stations and aftermarket replacements. For both installation types, the water can be pumped down to the top of the volute. This will help prevent debris buildup and should keep your lift station cleaner. More time between vacuum truck visits means lower maintenance costs, saving $500–$2,000 in normal stations and up to $10,000 in hazardous waste stations.

For new lift stations, the smaller required operating volume allows the wet well to be shallower and less expensive to build.

For aftermarket replacements, the envie3 pumps allow for a larger operating range, which means the pump can have a higher capacity. The customer can easily increase the flow out of the station by increasing the motor horsepower.

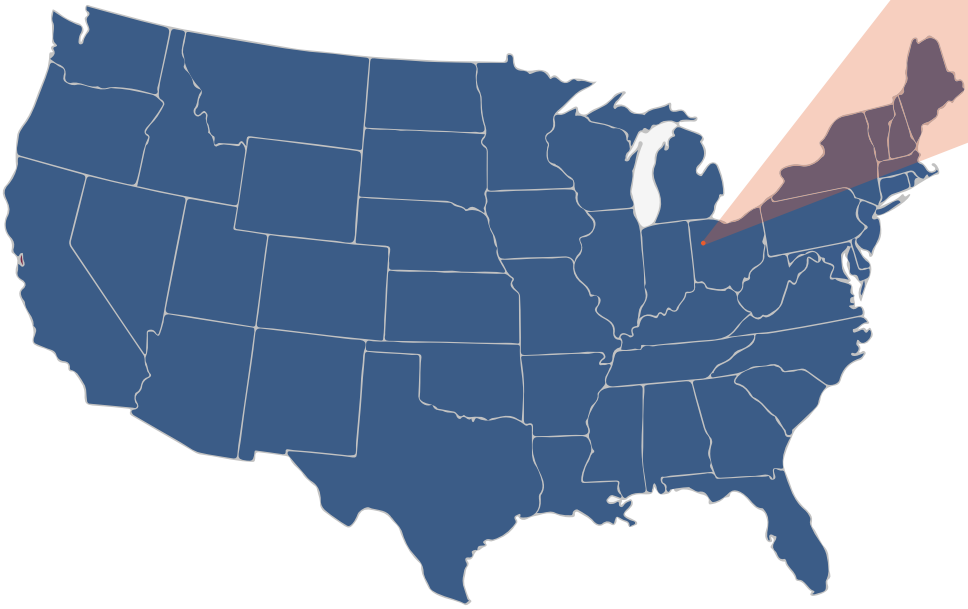




Location and Lead Time

When it comes to lead time, location is very important. In addition to being manufactured in the USA, the envie3 uses non-proprietary, widely available seals and bearings, which leads to lower cost and lower lead time for repair parts.

BUILT IN THE USA!



Longer Motor Life

There are a variety of reasons that the envie3 pump's motor will last longer in your submersible wet-pit installations AND your dry-pit installations.

Motor runs cool because of the integrated cooling system.

Higher temperatures shorten motor life. According to the U.S. Department of Energy, **for every 10 degree rise in operating temperature, the installation run life goes down in half** (https://www.energy.gov/sites/prod/files/2014/04/f15/extend_motor_operlife_motor_systemts3.pdf). The integrated cooling system within the envie3 utilizes a chamber that moves coolant/glycol around the motor. This keeps it cooler leading to an overall extended pump life.

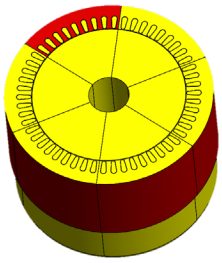
Heat map readings of competitor vs. envie3

Having a more efficient motor means you waste less energy

When comparing two pumps, the pump that runs cooler will impart more energy to the fluid than one that runs warmer. This means that you can pump more per HP, or you can use a lower HP motor to pump the same amount. The higher efficiency motor also means a lower amp draw, so some installs can fit a larger HP motor to increase pump capacity.

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.

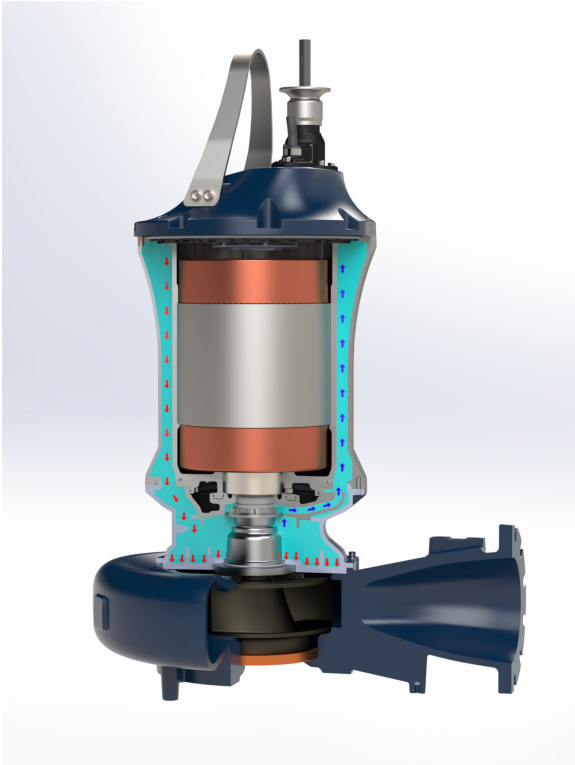


Permanently lubricated high capacity bearings

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.

Enhanced Cooling Efficiency

The E36 frame envie3 includes a patented integral cooling jacket, which reduces the number of joints and O-rings, providing less chance for glycol leaks and improved cooling.

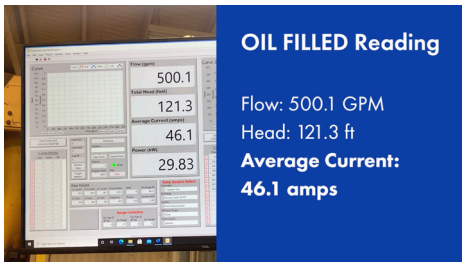


Energy Cost Savings: Oil Filled Submersibles

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 (depending on previous installation)!

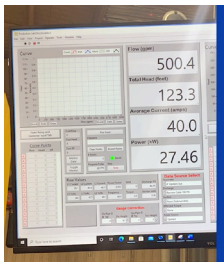
WATCH AN EFFICIENCY DEMO COMPARING OIL TO AIR FILLED PUMPS: youtube.com/watch?v=MVZdh5CxWwQ

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 (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: 500.1 GPM
Head: 121.3 ft
Average Current:
46.1 amps



envie3 Reading

Flow: 500.4 GPM
Head: 123.3 ft
Average Current:
40.0 amps

Oil Filled

Amperage	46.1	amps
Voltage	471.3	volts
Power Factor	79.7	%
Hours/Day	10	
Days/Year	365	
$/kwh	0.12	

Annual Energy Cost $ 13,136.86

envie³

Amperage	40	amps
Voltage	471.3	volts
Power Factor	79.7	%
Hours/Day	10	
Days/Year	365	
$/kwh	0.12	

Annual Energy Cost $ 11,398.57

By switching to the envie3, the customer can save $1738.28 annually!!

Over the 5 Year Limited Warranty, this will save the customer $8691.4!!

Annual Energy cost can be calculated with the below equations (using amps or by flow). Resources are avaliable to automatically calculate this for you. This calculator can be obtained from your RSM

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, and the same size envie motor. When you're unable to perform a calculation, this can help reinforce the efficiency differences.

Motor	Oil Filled FLA	Envie3 FLA
7.5HP, 1750RPM, 460V 3 Phase	11.9	9.72
7.5HP, 1150RPM, 230V 3 Phase	24.0	19.1
20HP, 1750RPM, 460V 3 Phase	26.9	23.1
30HP, 1150RPM, 208V 3 Phase	90.8	77.0
50HP, 1750RPM, 460V 3 Phase	67.1	57.0
10HP, 870/850 RPM, 575V 3 Phase	15.4	11.6

Solids Handling and Configuration Options

The envie3 is available in both chopper and non-clog wet ends. These pumps took Crane's proven non-clog and chopper wet ends and outfitted it with a premium efficient/ IE3 motor that can run in both vertical and horizontal configurations. The envie3 is Barnes' and Deming's most versatile and efficient solution to date that will solve clogging problems in any application. This saves time, money, and resources.

OPEN CENTER CUTTING DESIGN

EASE OF SERVICING AND UPGRADABILITY

HEAT TREATED 440C STAINLESS STEEL RETAIN SHARPNESS

Field replaceable striker plate and slicing blade

Unique, patented open center cutter mechanism

Solids size reduction from 1"–3" to prevent clogging of down-stream component

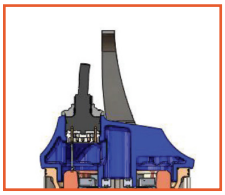
Check out some chopping videos!

Ease of Installation

Cords

The Barnes Plug & Play cord is revolutionary in the world of submersible and dry-pit pumps. While the option to easily remove the cord is common, the ability to easily change the voltage for pumps 20HP and below is unique. Other manufacturers require that the pump and cord be rewired to switch between 230V and 460V, which can be difficult and time intensive.

Furthermore, the Barnes & Deming Plug & Play cord allows for a quick installation, compared to the standard NEMA motor, which requires complex and time intensive wiring, along with the requirement to source a power cord.



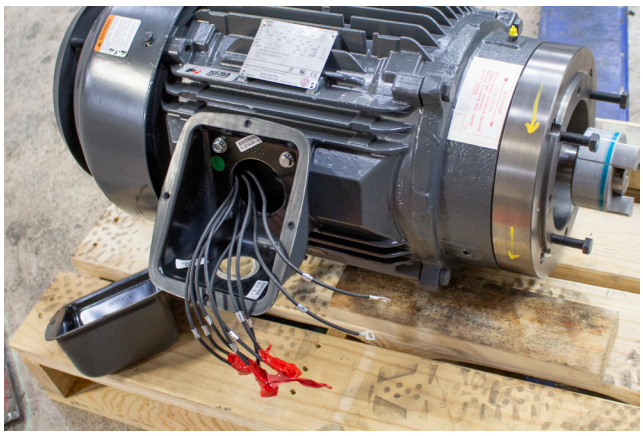
envie³

Plug-and-Play "Quick Connect" Cord

Easy Removal? ✓ | Voltage Change? ✓

NEMA MOTOR DRY PIT COMPETITORS

With NEMA motors, an electrician is required to install the pump. It's complex wiring system is difficult to install, maintain, and change.



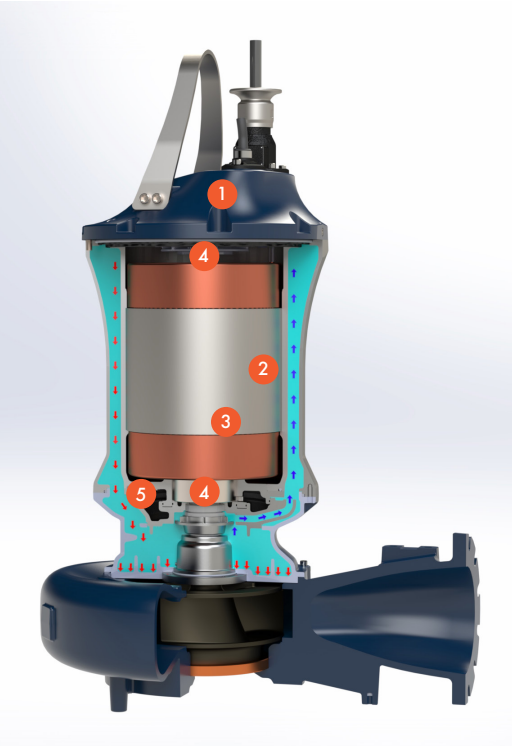
Installation

In standard dry pit pump installations, the stuffing box or seal cavity needs to be lubricated with a clear, pressurized fluid in order for the seals to operate correctly. This can be costly, as the station must include a source of clear liquid or a filter assembly to use the pumped fluid, and piping to the seal cavity. This is not necessary for the envie3, as the seals are lubricated by the glycol in the cooling jacket.

envie³ Sensing Package

Sensing the future: envisioning more with envie³

Available on E36 frame pumps (4" through 12" discharge, 30HP to 125HP), the envie3 sensing package will bring you peace of mind when it comes to pump operation. Protect important equipment with vibration sensors, temperature sensors, motor protection and seal failure sensing, extending the pump service life and time between repairs.



1 **Vibration Sensor**: Excessive vibration can shorten the overall pump life, and can indicate clogging. Identifying excessive vibration early can help extend pump life and time between repairs.

2 **Winding Temperature Sensors**: This can help determine if the pump is running in it's preferred range, thus extending pump life by monitoring pump performance.

3 **Winding Protection**: In the event the motor overheats, these switches will act as an alert that the pump needs to shut down, preventing damage from excessive temperature.

4 **Bearing Temperature Sensor**: Protects the pump from premature bearing or shaft failure, thus extending pump life and time between repair by avoiding premature bearing or shaft failure.

5 **Moisture Sensor**: Detects seal failure with a normally open float sensor. The sensor alerts that the seals have failed and moisture has entered the leakage chamber.

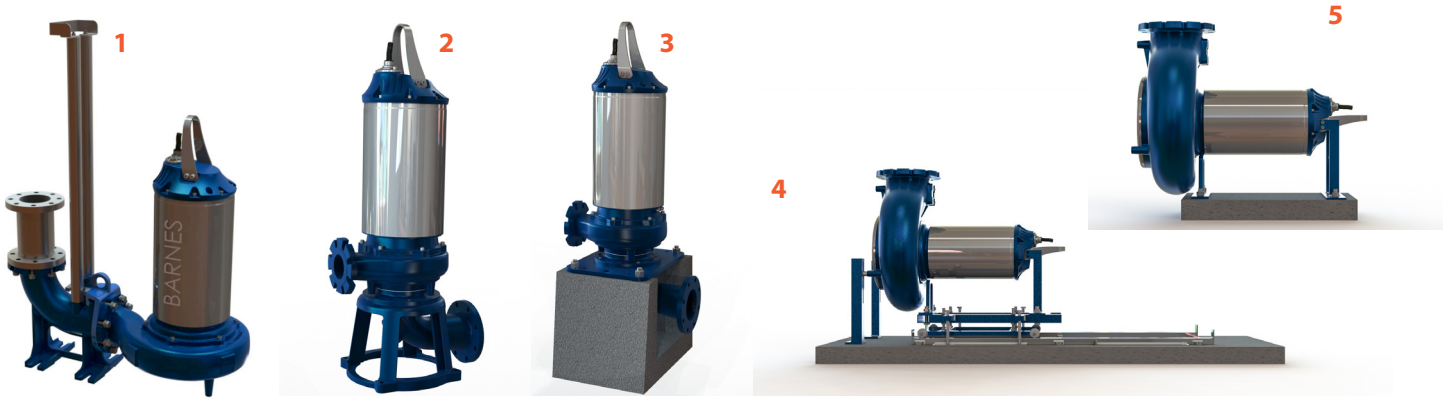
Heat dissipation:

- Heat transfer from the motor to the volute
- Glycol flow for cooling

The new E36 frame monitoring relay will connect all of the sensors to the control panel. The relay will also be capable of measuring the pump current and voltage using external inputs, allowing for potential issues to be detected from the control panel before the pump is damaged. The relay will have customizable set limits for "Warning" and "Alarm" levels.

Retrofitting & Adaptability

The configuration flexibility of the envie3, 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.



The introduction of the envie3 brought along an expansion of the Barnes and Deming mounting accessories.

1. **BAF:** Our classic BAF design has not changed, and is fully compatible with the envie3.
2. **Vertical Stand with Suction Elbow:** This design matches what you would typically see in a vertical dry pit installation, but with a twist. The adapter plate on the stand allows the pump discharge to be spun 360° for easy adapting to existing piping, whether tangential or centerline.
3. **Concrete Adapter:** An adapter for use with existing concrete stands, or for new applications requiring concrete base. It is very similar to the vertical stand, except with a concrete stand in place of the cast stand. This still keeps the adapter plate that allows for 360° rotation. These will almost exclusively found in wastewater treatment plants, and the contractor must source the concrete portion.
4. **Cart System:** The new cart system allows the driver assembly to slide back, while leaving the volute in place and not disturbing the suction and discharge piping. The system is also easy to install. The cart system allows for easier maintenance , due to the fact that a crane/hoist is no longer needed. (Note: The cart allows 1" of vertical movement to ease installation)
5. **Fixed Bracket:** A two piece fixed system for horizontal mounting, which is a more affordable option to the cart system.

Impeller Options

Envie3 pumps are available with the industry standard ductile iron impellers, but also have the option for White Iron (high chrome) impellers, which makes the envie3 equipped for harsh, abrasive applications.

White Iron 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

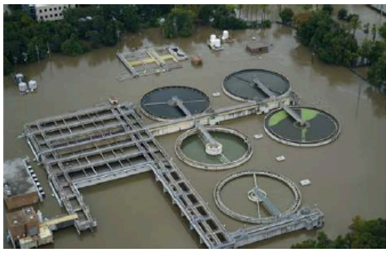
CONSISTENT HIGHER PUMP EFFICIENCIES

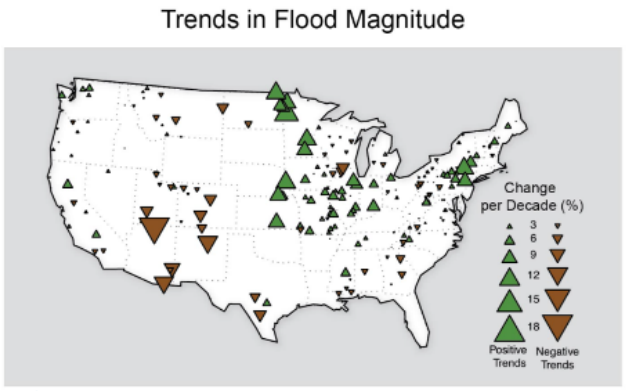
- Nickle hardened material provides higher hydraulic efficiencies over longer periods of time while reducing energy and operating costs

Flood-Proof Design

Natural Disaster Events

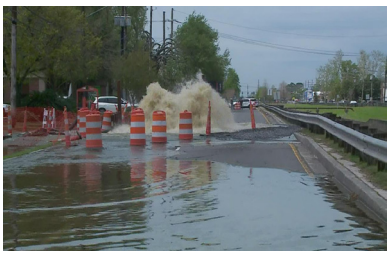
Weather events over the past decade caused more than $400 billion in damages, and more record-breaking catastrophes seem to be occurring every year, according to a new report. These weather events include floods, hurricanes, and rising sea levels. All of these have the potential to damage coastal regions and their water and waste water facilities. Envie3 motors are the optimal solution for wastewater treatment plants in coastal regions (when selling against dry pit) due to their flood-proof construction and ability to run both submerged and unsubmerged. **Even outside of coastal regions, flooding from storms and bodies of water can be a growing issue.** The envie will solve that problem.





Emergency Events

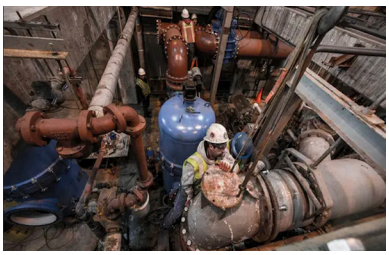
1. Force main breaks



2. Piping breaks

3. Valve Failures

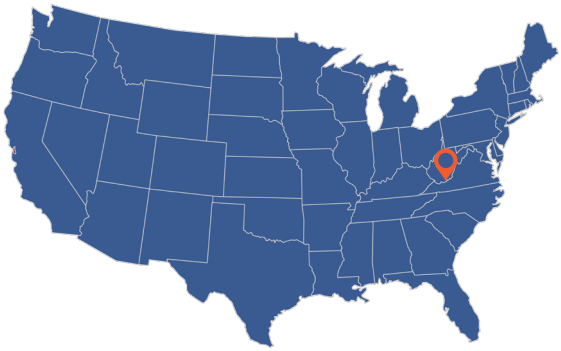
4. Pump Failure



5. Human error

Case Studies

BLUEFIELD SANITARY BOARD
City of Bluefield, WV



Application Overview
The City of Bluefield is one of the core cities that sits on the West Virginia/Virginia border. Serving a population of about 22,000 people, the Bluefield Sanitary Board is comprised of approximately 350 miles of sanitary sewer lines all leading back to two treatment plants. About 9.5 million gallons of sewer run through the two plants every day, with the Westside Treatment Plant treating 8.3 million gallons and the Ada Treatment Plant treating 1.2 million gallons.

Pump Station Details
Bluefield has 7 pump stations, all of which have had consistent problems with clogging issues, mechanical failures, and constant maintenance. The pump issues had become daily occurances, frequently hair and plastic would get stuck in the existing pumps. Each time a pump would clog or fail, it resulted in costly downtime for the treatment plant. Surrounded by mountains, the City of Bluefield prides itself on a community oriented and safe atmosphere. With these daily issues, the Bluefield Sanitary Board knew that they needed to upgrade their equipment to live up to these promises to the community.

Installation
This was the perfect opportunity for Buchanan Pump Service & Supply Co, a local Barnes distributor, to step in and test a new solution for Bluefield. In February 2021, they installed an envie^3 Non-clog Barnes pump in a triplex dry-pit station at the treatment facility. The pump is a 4″ ESH 15HP non-clog with a maximum flow of 800GPM. With the help of the 4x6 base elbow, the envie^3 was easily installed with minor piping changes from the original competitor. Since installation, the pump's average daily run time has been 7 hours, starting approximately 8-12 times each day. The Bluefield team has noticed a significant reduction in surface temperature of this new pump in comparison to the other units in the station due to the envie^3's glycol cooling system. The max temperature that it has reached has been 90°F due to the pumping volume doubling on that specific occasion. Since installation, Bluefield has not experienced any issues with the envie^3 pump. Due to the cooler surface temperature, reduced clogging issues with no occurrences since installation, and the easy installation, the Bluefield Sanitary Board is considering replacing the other units in the triplex station with the Barnes envie^3. They are also planning to outfit the sister station with a Barnes solution as well.

PUMP
Barnes envie^3 Non-Clog (4ESHDI)

OPERATIONAL IMPROVEMENT
Reduced Maintenance Costs

MUNICIPALITY POPULATION
22,000

INSTALL DATE
February 2021

Before installation of new pump

After installation of envie^3 pump

Key Takeaways

Pain Points
- Costly time and maintenance to unclog debris from pumps on a daily basis
- Pumps running really hot, causing safety concerns for those servicing the units

Benefits
- The Barnes envie^3 Non-clog pump's impellers are designed for clogging resistance and optimal pumping efficiency
- The low surface temperature of the envie^3 is cool to the touch allowing for a safer environment for all

WANT ANOTHER CASE STUDY? CHECK OUT THIS VIDEO:
https://www.youtube.com/watch?v=jDCnN2nMIQQ

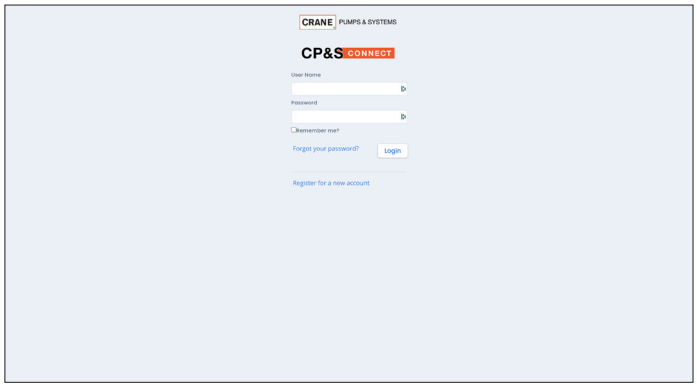
Additional Resources

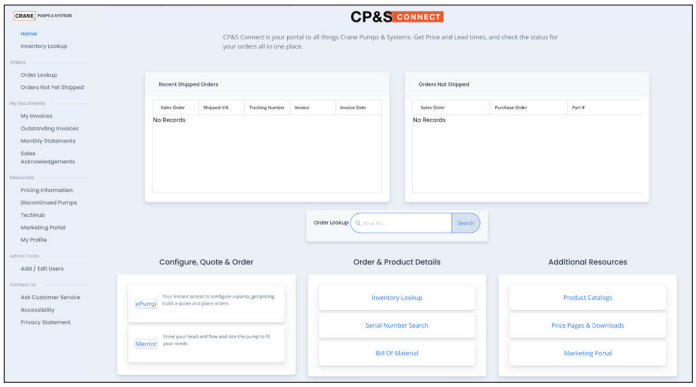
Crane Pumps & Systems Website: cranepumps.com or offer.cranepumps.com/envie3-pumps

Our general CP&S website (www.cranepumps.com) and the envie[3] microsite (www.offer.cranepumps.com/envie3-pumps) are great places to look for product catalogs and manuals. The sites give general information about the features and benefits of the pumps and detailed product information about the entire envie[3] series portfolio.

CP&S Connect: cpsconnect.cranepumps.com/

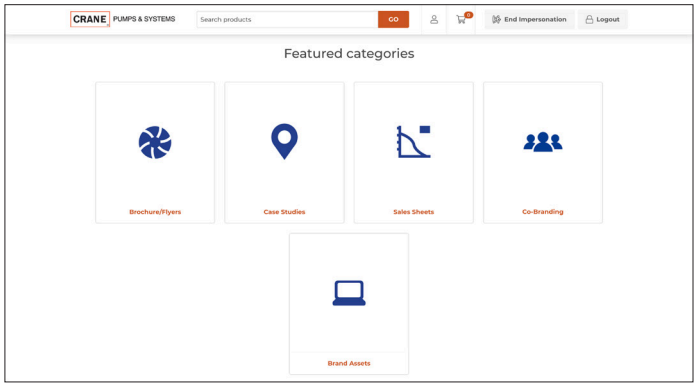
This is your portal to all things Crane Pumps & Systems. Size, price and check the status of existing orders all in one place.





Marketing Portal: order.connect360hub.com/crane/

Here is your portal to order printed literature or download PDF copies of sales sheets, flyers, brochures, case studies, etc. 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." Having trouble getting set up? Contact the CP&S Marketing Team.



Social Media Channels

Whether on Facebook, Instagram, Twitter, LinkedIn, or YouTube, stay up to date on everything CP&S by following us on social media!

CP&S Sales Team

We are always here to help! If you have any questions, concerns, or issues. Feel free to always reach out to your RSM, VP/GM, or Customer Service.

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