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Crane Pumps & Systems

4SE and Sewage Pumps

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PUMPS & SYSTEMS

Types of Submersible Wastewater Pumps

Sewage Ejector – 1”- 2” solids. Household wastewater which may contain human waste.

Non-Clog Sewage - 3” and larger. Municipal and Commercial wastewater

Fundamentals of a Wastewater System

Everyone. Everywhere. On Time Every Time.

- ❑ The function is to receive and collect “used water”, store it temporarily and move it to a collection system.
- ❑ Wastewater pumps are designed to handle effluent with some solids; not solids with some effluent in it.

Seven things you need to know in order to properly size a wastewater pump

- State and Local Codes
 - Size of solids
 - Required capacity
- Total Dynamic Head
- Receiver Basin Size
 - Pipe size
- Electrical Service

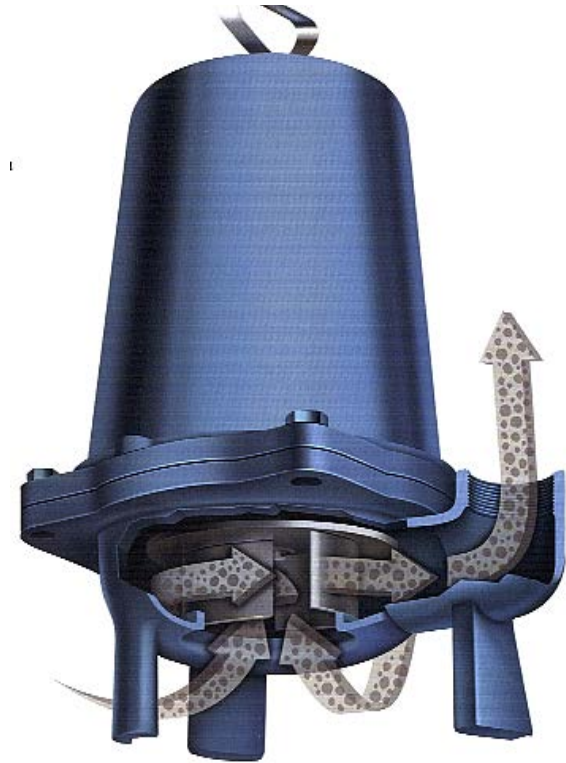
How a wastewater pump works

Everyone. Everywhere. On Time Every Time.

The wastewater pump is a centrifugal pump consisting of a rotary impeller working inside a stationary casing or volute. Its job is to pump wastewater uphill to a collection or receiving station.

The pump motor turns the impeller which transfers velocity to the liquid which surrounds it. This liquid is collected by the casing and directed to the discharge nozzle of the pump.

The submersible wastewater pump differs from normal centrifugal in that solids must be able to pass through the pump. This requires special open or “non-clog” impeller designs. Vortex impellers also offer added value when solids are present.





Pre-packaged Basin

No-hub Connection

Quick Float Access

Check Valve

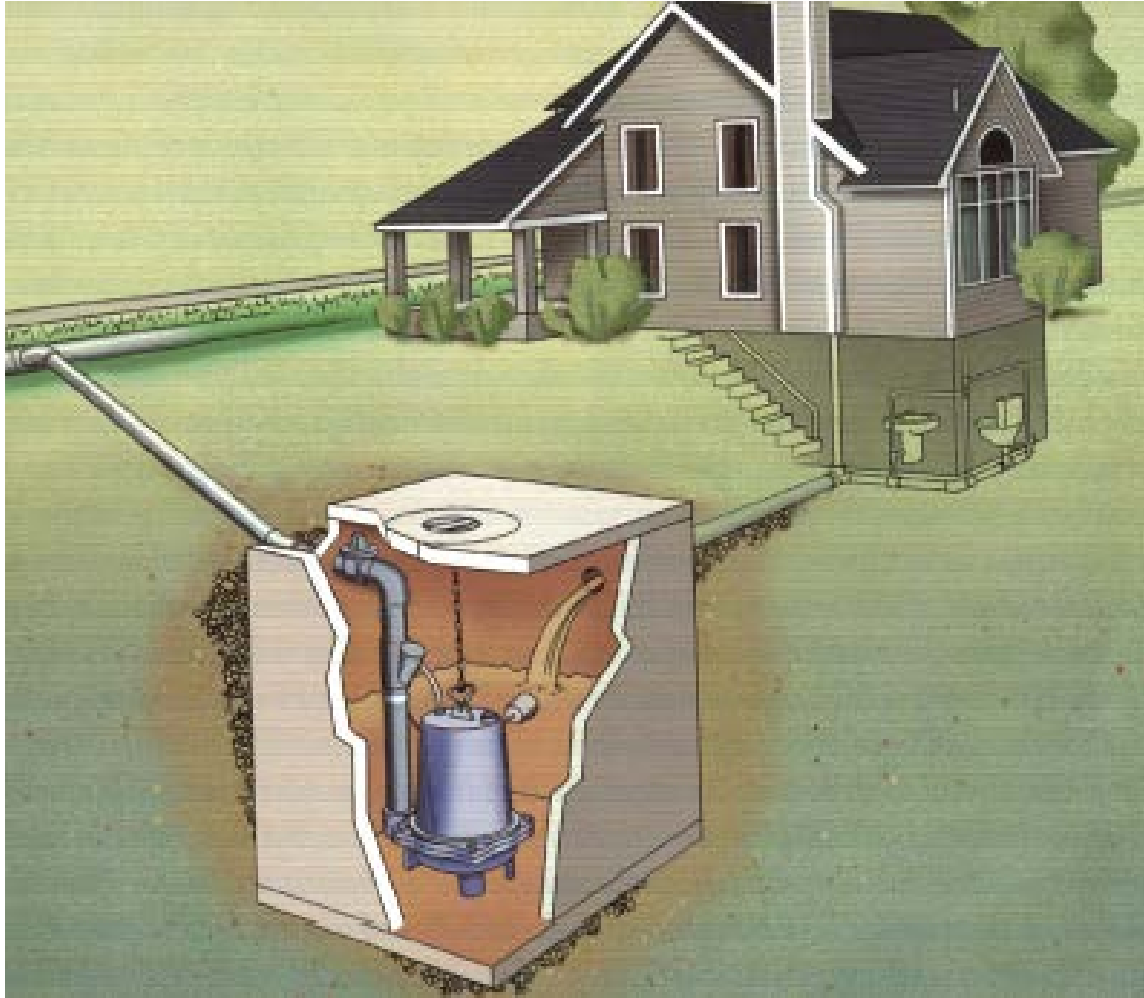
Anti Floatation

Sleek Design

Superior Quality Pump

TYPICAL SEWAGE EJECTOR APPLICATION

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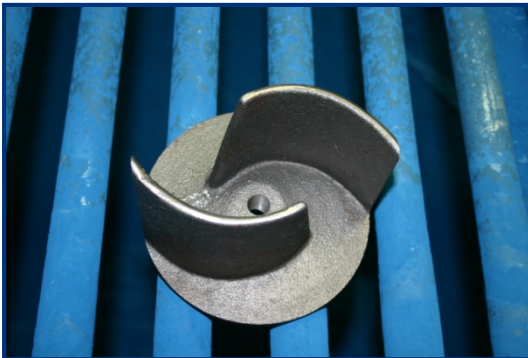


Residential System

2" Solids

Contaminated water
is drained into basin
which is then
pumped to a gravity
sewer system.

- What is a Sewage Ejector?
 - A submersible sewage pump designed to pump sewage uphill to a gravity sewer system
- A Sewage Ejector can pass up to 2" solids – i.e. what can pass through a toilet
- Sewage Ejectors are typically available with both vortex and semi-open impellers
 - HP/efficiency vs clog resistance trade-off



■ Commercial / Municipal

- Many pumps at 1750 RPM for better seal and bearing life
- Double seals available
- 2" and 3" NPT discharge
- 1/2 to 3HP, variety of voltages
- Manufactured in Piqua
- SE412
- SE52
- SE511/SE521
- SEV511/SEV521
- SE594/SE544
- SE774/SE794/SE744
- SE1074/SE1094/SE1044
- 2SEV ½ to 2HP
- 3SE ½ to 3HP



■ Lighter Duty

- Most pumps at 3450 RPM for low cost
- Single Seals only
- 2" NPT discharge only
- 0.4, 0.5 HP, 120V
- Manufactured in Zhuji China
- SEV412
- SE411
- SE51



Sewage Ejectors

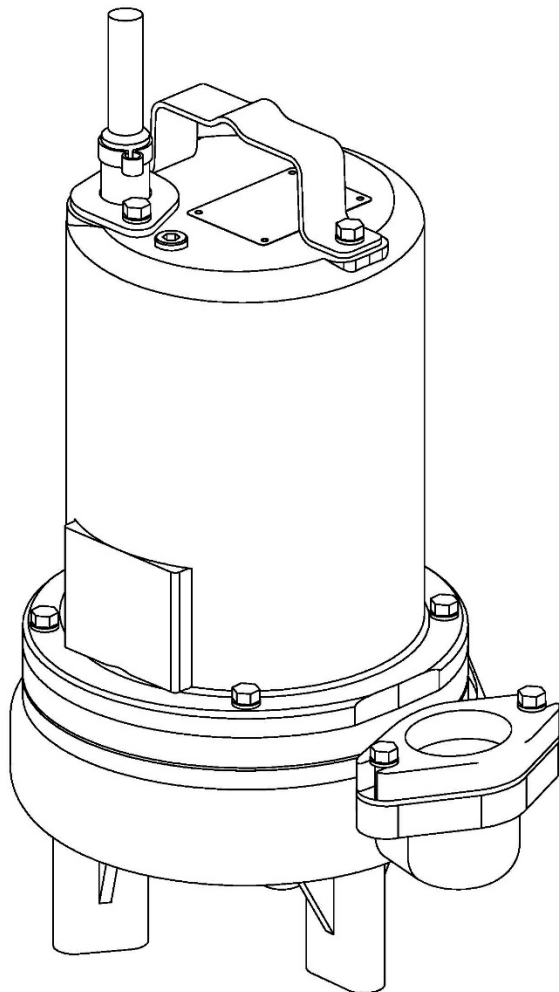
Everyone. Everywhere. On Time Every Time.

- All pumps are Oil Filled
 - Better motor heat dissipation
 - Oil-lubricated bearings last longer
- Plug-in Power Cords simplify maintenance as the pumps are merely un-plugged before service
- Double seals use Buna diaphragms to pressurize the seal chamber
- Pumps with double seals have two plug-in cords:
 - One for power
 - One for temperature and moisture detector circuits
 - Cords available in 30, 50 & 100 Ft



Sewage Ejectors

Everyone. Everywhere. On Time Every Time.



- NPT Discharge Connections
- Standard pumps are rated for 104° F liquid in continuous operation
- Hi-Temp pumps are rated for 200° F liquid in continuous operation
- CI construction, SS hardware, Buna o-rings
- Bolt-on flange (2", certain 3" discharge) simplifies piping
- Cast-in feet provide high clearance above inlet to reduce clogging potential
- Standard seals are carbon vs ceramic, Buna
- Silicon carbide & tungsten carbide faces available

- Level Controls

- Inline (Piggy-Back) floats for switching 115 V up to 10 Amps
- Pilot Duty floats – control voltage switching of starter

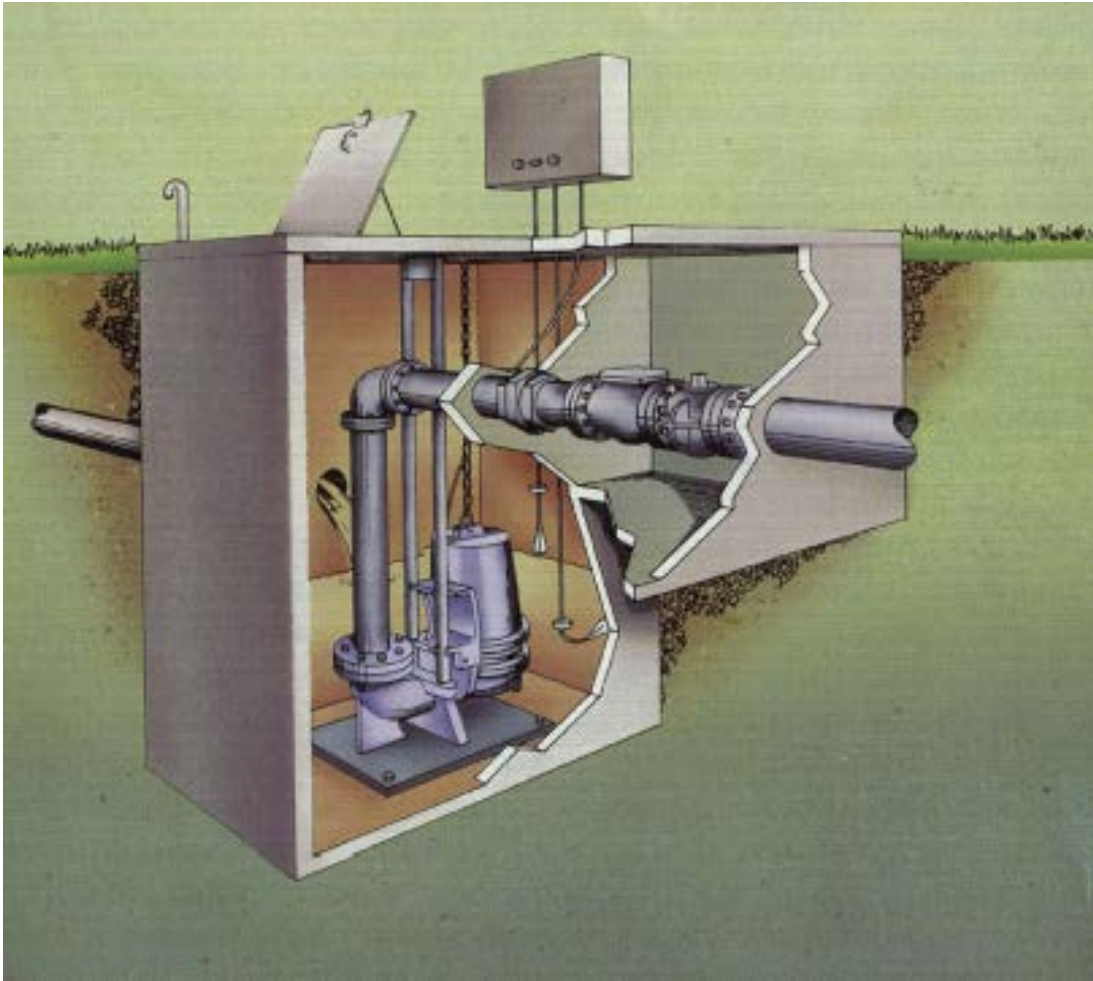


- Base Elbows - BAFs

- Make pump removal easy
- Designed specifically for vertical discharge pumps
- Fit any sewage ejector or grinder

TYPICAL COMMERCIAL SEWAGE INSTALLATION

Everyone. Everywhere. On Time Every Time.



Sewage lift station

Sewage lift station equipped with one sewage pump, lifting sewage to a gravity feed collection system.

4SE Solids Handling Pumps

Everyone. Everywhere. On Time Every Time.

- The 4SE is a Commercial-quality solids handling pump
- A 4SE is *different* from a 2 or 3SE:
 - Horizontal flanged discharge
 - 3" solids handling capability (2" on smallest pumps)
 - Higher service factor
 - Large stainless steel lifting bail
- 4SE pumps are fitted with semi-open impellers
 - Vortex impellers also available on some sizes
 - HP/efficiency vs. clog resistance trade-off
 - Very large installed base
 - Competitive with other commercial players
 - Myers, Goulds, Homa, Zoeller, Grundfos, etc.



4SE Solids Handling Pumps

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- Flows to 960 GPM, heads to 126 Ft
- Small Frame motor housing
 - 0.9, 1.9, 2.8, 3.7 & 5 HP
 - 1.15 service factor
 - Class B insulation
 - 104°F maximum liquid temperature
- Large Frame motor housing
 - 4.5, 7.5, 11.3 & 15 HP
 - 1.15 service factor
 - Class F insulation
 - 140°F maximum liquid temperature
- Applications:
 - Raw water
 - Non-corrosive waste water
 - Raw Sewage

4SE Solids Handling Pumps

Everyone. Everywhere. On Time Every Time.

- Materials of construction
 - Casing – ASTM A48 CI 30 cast iron
 - Impeller - ASTM A48 CI 30 cast iron
 - Seal & Bearing Plates - ASTM A48 CI 30 cast iron
 - Lifting bail & hardware - 300 Series Stainless Steel

- Motor, seal and cord configurations:

	Small Frame	Large Frame
Motors	0.9, 1.9, 2.8, 3.7, 5.0 HP	4.5, 7.5, 11.3, 15 HP
Motor Ratings	Class B, 1.15 SF, 104° Max Liquid Temp	Class F, 1.15 SF, 140°F Max Liquid Temp
Mechanical Seals	Single or Double	Double
Cords	Plug-in power cord. Double seal pumps have 2nd cord for moisture & temperature sensors	Two epoxy-sealed cords, one for power & one for moisture & temperature sensors

4SE Solids Handling Pumps

Everyone. Everywhere. On Time Every Time.

- Discharge flange is 4" 125# ASA rating
 - 0.9 & 1.9 HP unit volutes are double-drilled for 3" connection as well
- All pump motors are oil-filled
 - Better motor heat dissipation
 - Oil-lubricated bearings last twice as long as grease bearings of the same size
- Mechanical seals are type 21 double (or single) carbon/ceramic w/ 300 SS springs & Buna elastomers
 - Alternate seal faces available
 - Silicon carbide
 - Tungsten carbide
- Double seal pumps are provided with a buna diaphragm; pump discharge pressure charges the oil-filled seal chamber
- Cords available in 30, 50 and 100 Ft lengths
- Single row radial and thrust bearings

4SE Solids Handling Pumps

Everyone. Everywhere. On Time Every Time.

- 4SE paint is water-based enamel, **Barnes blue**.
 - DuPont Corlar epoxy paint available as an option
- 4SE impellers are non-overloading (NOL) trims for each motor size
 - Special trims available for additional cost
- Cast-in feet on the volute provide for free-standing units



BARNES®

4SE – Matching BAF

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- 4SE pumps can be installed in two ways:
 - Free-standing on cast feet
 - Hard-piped can be difficult to service
 - Mounted on a BAF (break-away fitting) with slide rails
 - Easy to remove pump without disturbing piping
- The BAF4x4 is a 4" inlet, 4" outlet base elbow
- A mating slide rail fitting bolts to the pump discharge
 - The BAF is fitted with a buna "grommet" that seals the connection to the base elbow
- The assembly includes:
 - Base elbow
 - Slide rail bracket w/ grommet
 - Top mounting bracket
 - Optional intermediate bracket for pits deeper than 11 ft
 - Guide rail pipe (usually SS) provided by others





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QUESTION:

A NON-CLOG is designed to handle what size solids?

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Q&A



Thank You!