

# BARNES®

brands you trust.

The Next  
Generation of

**SOLIDS** *Handling*

*SH Series Pumps*



## Clogging Resistance

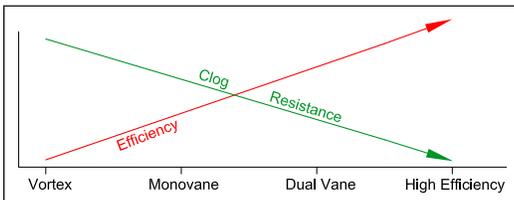
Contractors, treatment plant operators and utility customers' biggest problem continues to be clogging of Solids Handling pumps due to the ever increasing amount of solids entering the waste stream. Some of the items cited include towels, diapers, twine, panty hose, unraveled cleaning pads and toilet cleaner pads. Increased non-dissolving solids and less water entering the waste stream is increasing the need for submersible clog-resistance technology. The SH line of submersible Solids Handling Pumps has been designed and extensively tested with three types of impellers to minimize clogging:

**SHV Vortex** impellers provide excellent clog resistance, especially for stringy solids and at low flow, high head operation.

**SHM Monovane** impellers are used for applications with lower head where the concentration of velocity in the single passage effectively passes solids.

**SHD Dual vane**, enclosed impellers are effective on applications with high flow and head due to their large passage areas.

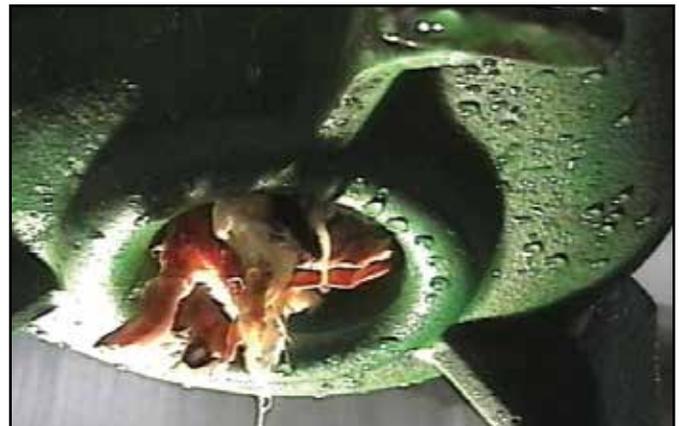
All 4" and larger pumps have true 3" minimum spherical solids handling capability.



Flow rates have a very strong effect on solids handling capability. Many sources cite the need for a minimum velocity of 2.0 ft/sec (0.6 m/sec) for full horizontal pipes and 3.0 fps (0.9 m/sec) for vertical pipes. SH Solids Handling pumps are designed to operate successfully below these limits.

## Clog Testing

In order to confirm our design's abilities to minimize clogging, Crane Pumps & Systems conducts clogging tests in a special test rig. Various articles such as panty hose, dish cloths, cloth diapers, rope, torn cleaning pads, stuffed animals and the like are pushed into the pump inlet one at a time, and then two at a time until the pump clogs, benchmarking against a number of popular competitive designs. Contact your Barnes Distributor if you would like to view video of several of these tests.



Competition's high efficiency pumps clog frequently in normal applications.

## Efficiency

Power consumption is an increasingly important consideration when selecting a Solids Handling pump. There is, however, a trade-off between pump efficiency and solids handling capability depending on the pump impeller selected.

The bigger issue is system efficiency, where the cost of sending a crew to service a clogged pump far outweighs the cost of extra power consumed, especially considering that most lift station pumps only operate part time.

One frequently used design technique to optimize power consumption is to use Variable Frequency Drives to operate pumps near the highest efficiency point on the curve. This requires that the motors be equipped and rated for inverter use.

## Inverter Duty Rated

All the motors for the SH Solids Handling pumps are Inverter Duty Rated in accordance with NEMA Specification MG-1, Part 31. This includes the requirements for spike voltage resistance, brief over-speed and over-current conditions, etc.

The SH utilizes motors with spike-resistant Class H windings and varnish. The motors are certified to C22.2 No. 108-01 and compliant to UL 778 by CSA and have a 1.2 or 1.15 service factor.

Stators are pressed into the motor housing for optimal heat conduction to the pumped fluid, and the housings are filled with non-toxic dielectric oil for both excellent heat transfer and ideal bearing lubrication.



Barnes SHV Vortex pumps solve clogging problems due to ragging and wipes.

SH Motor Ratings Chart																	
Speed (RPM)	3450																
	1750																
	1150																
	870																
		2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
		Horsepower															

Single and Three Phase

Three Phase

# Model SH Series Features

## Solids Handling Pumps

All pumps share the features shown below except for impellers and volutes

**SHV Patented Vortex** impellers provide excellent clog resistance, especially for stringy solids and at low flow, high head operation.

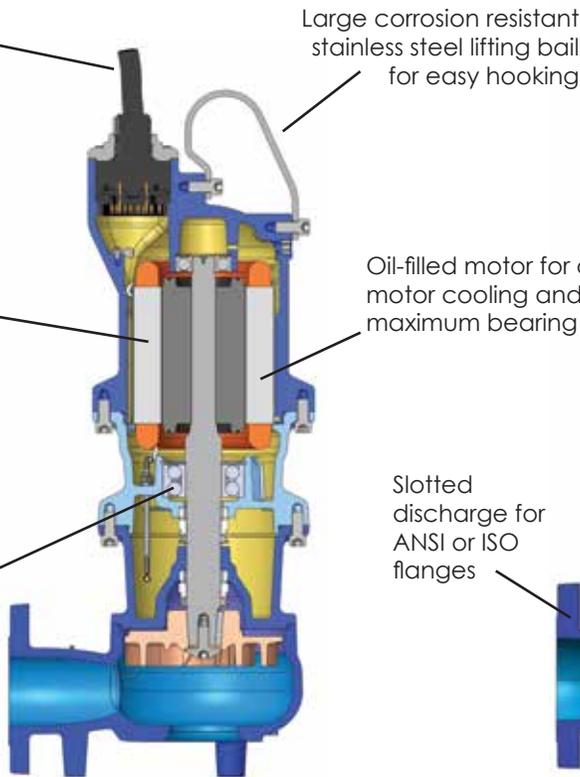
**SHM Monovane** impellers are used for applications with lower head where the concentration of velocity in the single passage effectively passes solids.

### 18 Frame Motor Shown

Plug-n-Play Power Cord (18 and 21 Frame Pumps) greatly simplifies pump installation and removal

1.2 service factor Inverter Duty Rated Class F system with Class H magnet wire

High capacity bearings to optimize life; 50,000 Hour life at 2 fps flow



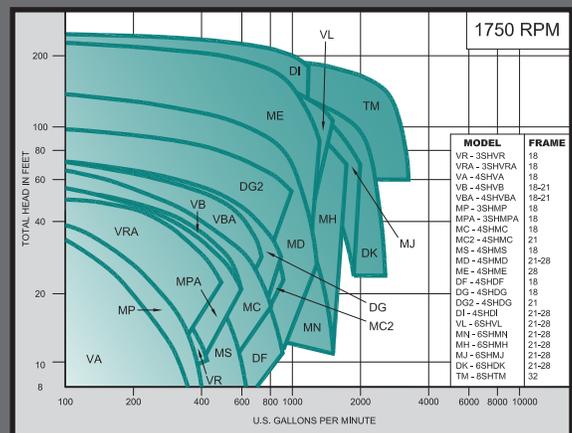
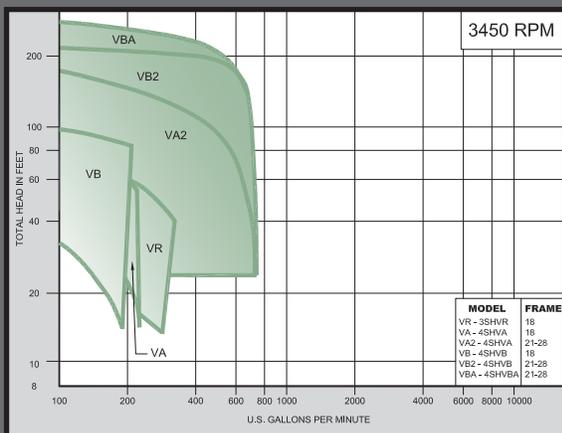
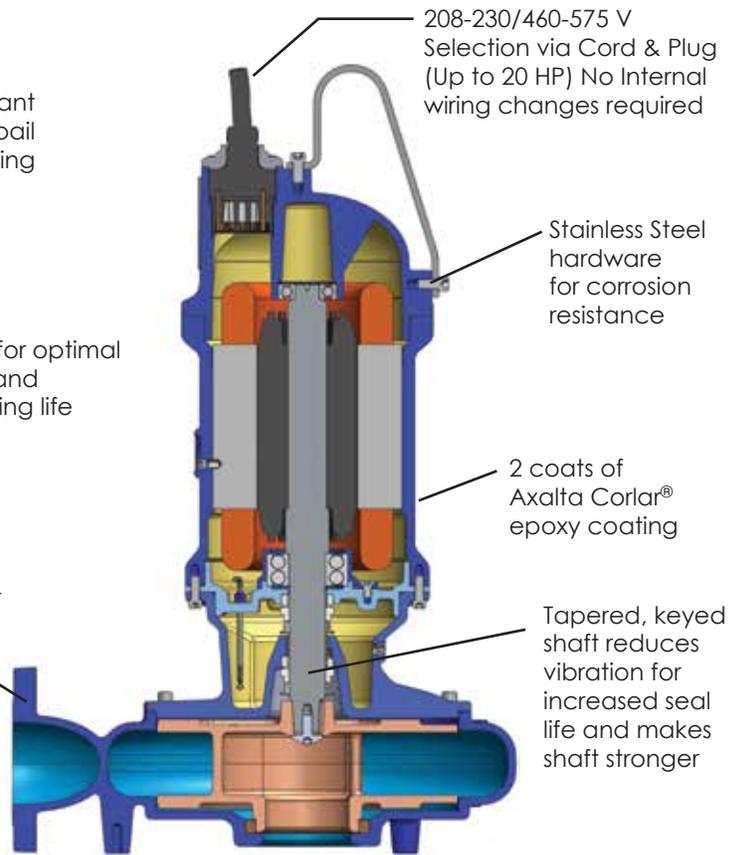
### 21 Frame Motor Shown

208-230/460-575 V Selection via Cord & Plug (Up to 20 HP) No Internal wiring changes required

Stainless Steel hardware for corrosion resistance

2 coats of Axalta Corlar® epoxy coating

Tapered, keyed shaft reduces vibration for increased seal life and makes shaft stronger



## 32 Frame Motor Shown

**SHD Dual Vane**, higher efficiency enclosed impellers are effective on applications with high flow and head due to their large passage areas.

X-Pruf® Optional  
Class I Group  
C&D Div 1

Smooth castings for easy washdown

Replaceable wear rings extend life of pump casings

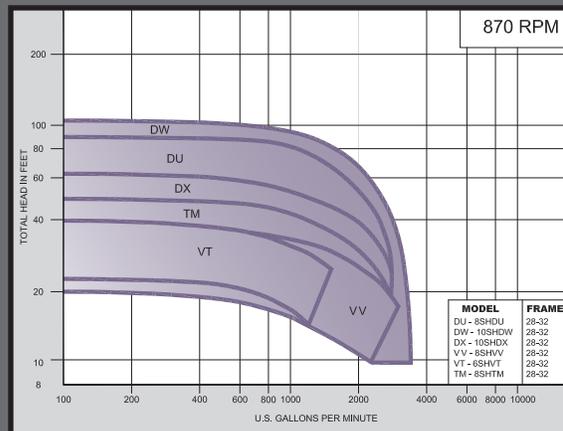
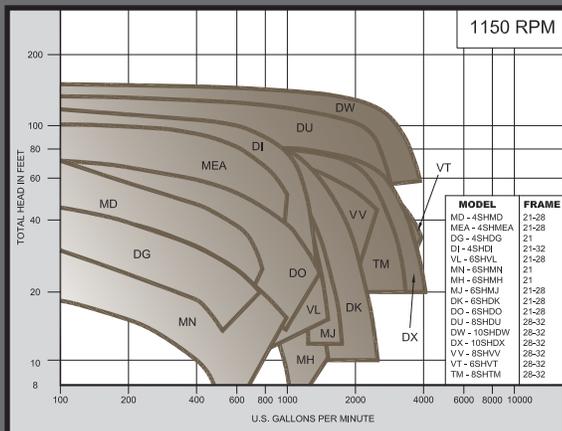
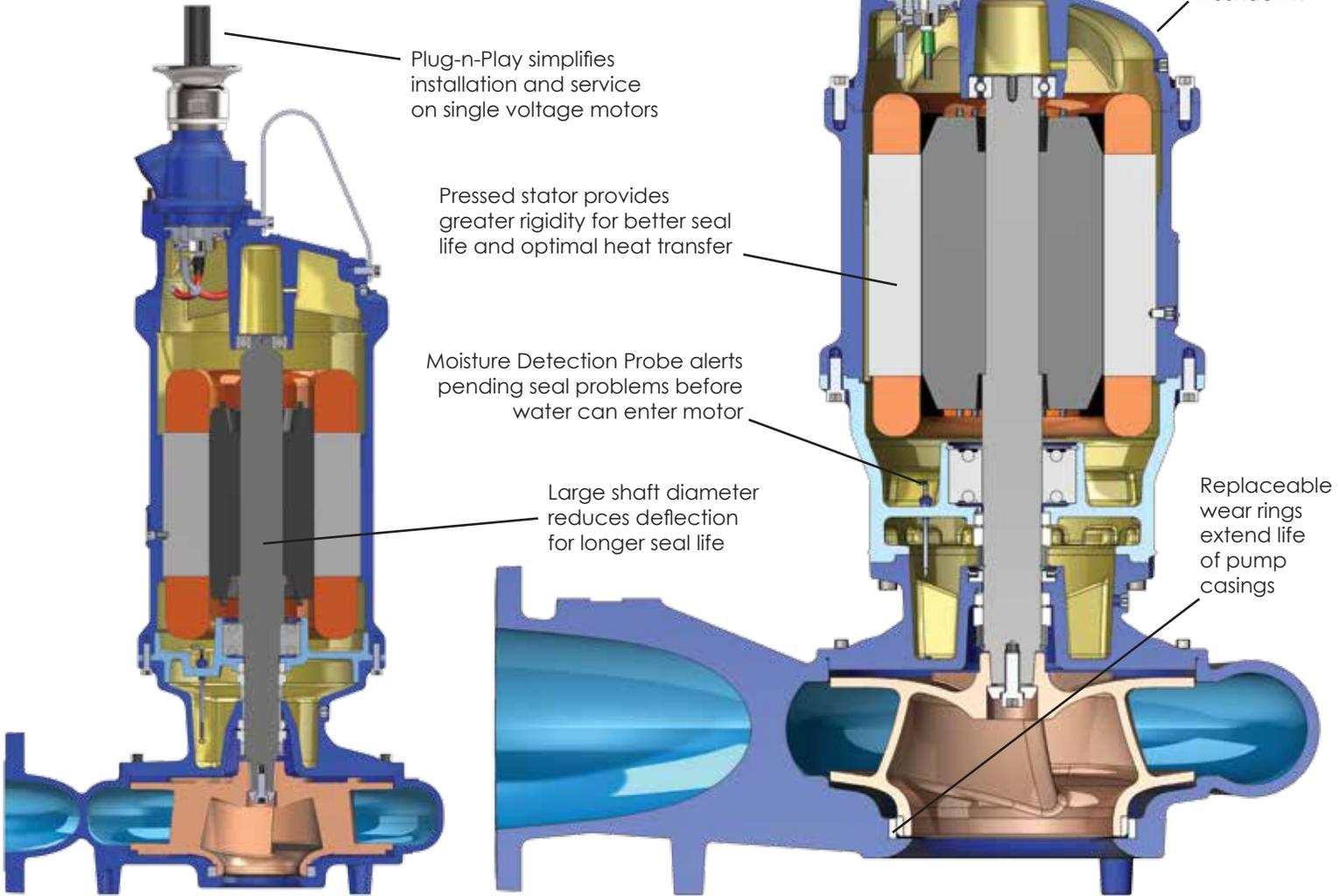
## 28 Frame Motor Shown

Plug-n-Play simplifies installation and service on single voltage motors

Pressed stator provides greater rigidity for better seal life and optimal heat transfer

Moisture Detection Probe alerts pending seal problems before water can enter motor

Large shaft diameter reduces deflection for longer seal life



# Model SH Series

## Cord and Entry

The cord combines power, temperature sensing and moisture sensor conductors into a single cable. This eliminates the need to disconnect power cords at the control panel or junction box:

- On the smaller frame motors, 2 through 30 HP, a plug-in power cord is furnished to allow easy changes of both voltage and cord length without motor entry.
- On the larger frame motors, 20 through 150 HP with much larger conductor sizes, plug connects the pump for simplified installation and removal.



## Mechanical Seals

Tandem mechanical seals are provided with silicon carbide seal faces on the pump end and carbon/ceramic at the motor end, both with Buna elastomers and stainless springs and retainers.

Optional silicon carbide and/or tungsten carbide faces are also available. These are readily available seals provided as spares either singly or in available seal repair kits, and are much more economical than proprietary cartridge arrangements.



The seals are lubricated by a large capacity oil-filled chamber and protected from water leakage into the chamber with a two-conductor probe that senses and alarms water entry well before any water can enter the motor housing.

The pump design, with large shaft diameter and tapered impeller drive, minimizes shaft deflection and vibration to better maximize seal life.

## 50,000 Hour Bearings

SH Solids Handling pumps are fitted with a single row top and double row bottom bearing and oil lubricated for maximum life.

The bearings are rated for 50,000 hour life at the flow rate corresponding to 2 ft/second in pipe, matching the discharge size.

## Coating System

The exterior of the pump is coated with two coats of Axalta Corlar® 2.1-ST high solids epoxy mastic system, based on an amido amine modified epoxy technology. The 10-12 mil DFT coating system is optimal for immersion service and proven in salt-spray accelerated life tests.

## Class I Group C&D Division 1 X-Pruf® Pumps

All SH pumps are available when required by Code as an XSH, an FM and/or CSA Approved Class I Group C&D Division 1 explosion-proof pump. X-Pruf option provides the same outstanding features of the standard SH. In fact, the pumps are mechanically identical, allowing us to ship X-Pruf pumps in the same short lead time as the standard SH Series.

## Slotted Discharge

For maximum flexibility, the pump casing is provided with a slotted discharge to easily accommodate both ANSI and ISO metric flanges, facilitating the use of a variety of US and European slide adapters.

## Mounting Options

The SH pumps are normally mounted on a slide rail system with Break Away Fitting or, with an available foot kit, in a floor mounted position.

## Break Away Fittings & Accessories

Crane Pumps & Systems also provides Barnes brand accessories to complete the construction of a lift station or other installation. Break Away Fittings are available to facilitate easy installation or removal of pumps via a slide rail system. For permanent floor-mounted systems, pump foot kits are available to support the pump high enough to prevent clogging between the pump volute end the floor.

Control Panels are also available for simplex or multiple pump installations, customized to meet your specification.

Other accessories include pit covers with access doors, lifting chains, pump hoists, level controls and check valves.

## Lead Times

The SH Solids Handling pump line is manufactured in a dedicated Lean Assembly Cell. Each pump is assembled, tested, painted and packaged within its dedicated cell, allowing for short lead times. Every SH Solids Handling pump is performance tested, and the resulting head-capacity curve is affixed to the Instructions and Operation Manual shipped with the pump.

## Service & Repair

Crane Pumps & Systems has an extensive network of Distributors and Service Centers throughout the US and Canada. SH Solid Handling pumps are manufactured at our plant in Piqua, OH and all parts are readily available.

In addition, parts kits are available. These kits provide the combination of parts needed to do a specific maintenance task. For example, the seal kit has the mechanical seals, gaskets and hardware needed to complete a seal replacement.





This product may be covered by one or more of the following patents and other patent(s) pending: US Patent 7,931,473, 8,120,360



A Crane Co. Company

PUMPS & SYSTEMS

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**burks**

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**WEINMAN<sup>™</sup>**



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