

Pitbull® Pneumatic Displacement Sump and Transfer Pumps for Severe-Duty Abrasive and/or Corrosive Applications

Yes, it is possible to reliably pump virtually any combination of abrasives and rock, to hot corrosives and toxic waste, to stringy and pipe-sized solids; with no inherent limitation between maximum solids passing, varying flow conditions and maximum discharge head; maintain a constant sump level by pump starting and stopping automatically; significantly reduce maintenance and downtime; improve environmental safeguards; not require personnel intervention; plus provide a fast return on investment.

How it works . . . the Pitbull pumping principle:

Pitbull patented pneumatic displacement pumps are simple to install, operate and maintain. The unique design features NO rotating or internal pump parts - NO diaphragms, NO bladders, NO level floats, NO bearings, NO shaft and NO impeller. The pumping principle uses compressed air acting directly upon the surface of the liquid being pumped, maintaining an air/liquid interface, and eliminating the need for any bladder or diaphragm. A Pitbull pump consists of a fabricated chamber with two specially selected swing check valves, and a control panel located above and remote. Flow enters the inlet check valve, filling the chamber, while the displaced air is vented to atmosphere. When the fluid level in the chamber is sensed to be full, the controls automatically close the air exhaust valve and open the air discharge valve, directing compressed air energy into the top of the chamber, automatically forcing the inlet check valve closed. Fluid contents with solids are forced out through the discharge check valve and connected piping. After each cycle, the air is automatically shut off and the fluid filling and discharge cycle is repeated as soon as the pump chamber becomes full again, automatically speeding up and slowing down to match the incoming flow rate, and on auto standby when no liquid is present, all unattended.

Simple to retrofit . . . and specify for new installations:

Pitbull pumps can be easily retrofitted as an upgrade for existing or specified for new installations. Pumps operate in submerged sump configuration or as a transfer pump with flooded suction.

Which model? Simply select a Pitbull pump model that will handle the maximum flow rate at desired head and will pass the maximum size solids. Then just set it and forget it.

Pitbull pumps handle abrasive fines to 5.5-inch solids, discharge heads to 100 psi, varying flows conditions from standby to 500 gpm and more. Operation to 200°F with custom models to 400°F.

The percentage solids can vary from high to low. If it flows by gravity, then we can pump it.

No electrical connections. No external level controls or floats required. Automatic cycling from standby to maximum flow, all unattended. No rotating parts that will wear out, sooner than later.

Pitbull S8ABR pumps have withstood the toughest tarsand abrasives with zero maintenance to date.

Pump abrasives and large solids . . . Prevent solids buildup in sumps:

The problem: Sumps act as natural clarifiers. Submersible centrifugal pumps are the conventional approach to transfer large flows, however when abrasives and large solids are present, an oversized centrifugal pump must be used. The difficulty arises when actual sump inflow rates of solids-laden flows fall far below rated pump capacity.

The challenge: To handle sand and 4 inch rocks, a 12"x12" rubber-lined centrifugal pump with a rated capacity of 2,000 gpm with floats might be chosen. What happens when solid-laden flows fall below 500 gpm? These pumps must sit idle, waiting for the sump water level to rise to the 'on' point, all the while solids are accumulating usually near pump inlet. This can result in pump cavitation, unplanned downtime, high maintenance and environmental spills and fines. Oversized centrifugals are expensive to purchase, operate and maintain and often ill-suited to handle varying flow and solids conditions.

The solution: Pump virtually any combination of abrasives and solids with no inherent limitation between solids passing, varying flow conditions and maximum discharge head.

Pitbull pumps can operate at any point left of the pump performance curve. They are supplied with heavy-duty full port check valves, able to reliably pass everything from abrasive sand and large rocks to long, stringy and hard pipe-sized solids to sewage and debris. The pumping action automatically opens and closes the inlet and discharge check valves, helping large pipe-sized debris work through the pump without plugging. The optional "flow inducement" creates a vacuum inside the pumping chamber during the fill cycle, influencing solids around the pump inlet area to be drawn into and through the pump. No impeller to wrap or bind stringy trash. Not affected by heat, chemicals, wear or tear. And Pitbull pumps never have to run dry because they start and stop automatically, without operator intervention. As soon as the pump reaches full level, they will automatically start and direct compressed air into the top of the pump chamber, and stop after each discharge cycle, allowing pump chamber to refill on demand. Problem gone!

Sludge transfer and filter press feed "variable head" pump option:

The problem: These applications are high maintenance due to abrasion, varying discharge heads caused by inconsistent solids content, and wide ranges of head as a filter press fills. Centrifugal pumps are abused by the variable head/flow and abrasion, while diaphragm pumps fail under the high cycle duty and abrasion wear and tear.

The solution: The Pitbull pump combines an extremely low cycle rate, the elimination of seals, impellers and diaphragms, and the inherent nature of the design to handle variable heads, automatically. The control panel has been specifically designed with an electro-pneumatic controller that automatically cycles the pump, slowing the rate as the back pressure increases. They will not over-cycle under low

heads, can be left to dead-head indefinitely without stalling, and will restart when the system stabilizes.

Hot corrosives . . . with solids too:

The same Pitbull all-pneumatic pump will handle tough corrosives, impossible for many pumps when laced with solids and subject to high temperatures. Standard corrosion-resistant models are supplied in 316 stainless and vinyl ester. Pump and valve options include:- Alloy-20, Hastelloy-C pump body with Viton and Teflon check valve seats. And custom designed pumps to suit specific requirements.

Condensate return pumping systems . . . Custom engineered:

No minimum NPSH requirement - just enough positive fill head makes the Pitbull pump technology an excellent choice for condensate return pumping upgrades and projects.

Experience: 200 gpm custom designed system in its second year with zero maintenance to date.

Solid pumping experience:

- sand and rocks • clarifier and underflow slurry transfers • hot acids with solids
- lime slurries • condensate return pumping systems • bottom ash slurry • raw sewage lift station • toxic wastes • automatic sump level control • coal conveyor transfer sumps • coolant with metal pieces • dewatering with solids • wood preservative transfer • hydrocarbons • filter press feed • run-off sumps • explosion-proof areas • API waste sumps • 300°F sulphuric acid with abrasives • dike sump
- MKB, isoferone and xylene transfer • foaming agents • coke oven run-off pit • brine sump • portable trash pump • skimmer to centrifuge • hazardous transfers • and more

How much compressed air will be required?

Pitbull pumps require compressed air to operate, which is normally available in plants.

Refer to the "Air Consumption Chart" for specific details. Electricity or floats are not required.

Example: To handle 1,000 usgpm @ 110 feet tdh, two Pitbull Model S8ABR pumps will be specified.

The total air requirement will be 566 scfm of compressed air. This is virtually the same energy requirement as an 85 hp centrifugal pump that the Pitbull pump would be upgrading.

If plant air supply was not available, we recommend the installation of an independent compressor. To quote a reliability engineer who is using several large pumps in a similar service:

"Even if we had to install a stand alone compressor to supply our Pitbull pumps, it

would be more than worth it considering the savings in maintenance and labour plus increased reliability and safety."

What spare parts savings can be expected?

Significantly reduce spare parts usage and inventory requirements. Experience has proven that spare parts usage has been typically limited to check valve seat replacements and air exhaust valve kits and occasionally a check valve that clients may decide to keep in their inventory.

Pitbull pumps have the lowest spare parts cost factor when compared with most other pumps, especially centrifugal and diaphragm pumps.

Justifications:

- Significantly reduce maintenance and unscheduled downtime.
- Significantly reduce spare parts inventory and turnover.
- Significantly reduce operator intervention and labour costs.
- Significantly improve operational reliability and safety.
- Improve environmental safeguards to avoid spillage, damage and fines.
- Fast return on investment with a long-term and reliable installation.