

Going With The Flow



Centrifugal pumps offer a basic, inexpensive way for moving water with little to no debris.

By Pam Meyer

Choosing the right pump for the application

Whether it is part of a typical water removal project or used in the event of an emergency such as a flood, a pump is an essential tool in removing unwanted water quickly and efficiently. On the surface, the task it performs is quite general, but it is important to realize that a pump is not a one-size-fits-all product. There are several types of pumps available, as well as varying degrees of quality. To ensure ownership of the proper pump that will provide years of reliable use, one must do a little homework on the types of pumps available, the ideal applications for each one and what to look for in a quality pump.

How It Works

Most small dewatering pumps are classified into the primary category of centrifugal. All centrifugal pumps work using the principle of centrifugal force, in which force moves objects away from the center in a system of circular motion, increasing the pressure as it rotates. In the centrifugal pump,

this force is caused by the rotation of the impeller, a circular disk with vanes that sling water around.

The impeller is enclosed within a housing known as the volute, and it collects and directs liquids through the pump. As the liquid is rotated, its velocity is increased, allowing it to be expelled from the pump quickly.

This motion is much like swinging a rock tied on a string. The velocity increases, and when the rock is released, it swings out, away from the center. In the case of the pump, this increasing pressure takes place inside the volute, and the liquid is forced through the discharge.

Within the broad class of centrifugal, a few different models exist. Each has a slightly different makeup and is intended for certain applications and water types.

Simple & Effective

A standard centrifugal pump is the most basic type of pump, and handles the simplest duties. Used to move clean water that has little



A semi-trash pump moves muddy water from a jobsite. Semi-trash and trash pumps' impellers are made with thicker veins than those in standard centrifugal pumps, which enables them to move larger debris.

or no debris, a standard centrifugal pump is perfect for tasks such as draining a pool or removing unwanted standing water. While these applications can be undertaken with virtually any pump, the standard centrifugal pump is a logical choice for anyone with these basic types of jobs, as it is the least expensive and performs its function well.

A Step Up From Standard

Because not all water is clean and free of debris, there are pumps designed to handle water with a higher solids content. A semi-trash pump has an impeller similar to the one found in a standard centrifugal pump, but it has deeper vanes to move more debris as needed. These pumps also generally have a larger discharge opening than a standard centrifugal pump to allow smaller debris and particles to easily pass through.

Tough on Trash

Trash pumps are almost identical to semi-trash pumps, but

with even deeper impeller vanes to allow for the largest discharge capacity. These pumps are used to move water that is muddy or sandy, or contains other solids that would damage the inner workings of a standard centrifugal pump. Generally, trash pumps are built with a more heavy-duty pump housing, rendering them more versatile. A trash pump often is standard equipment on virtually any construction site that needs to move water, particularly when there is potential for that water to contain abrasive materials.

A Workhorse

Of all the pumps available, the diaphragm pump may be the most versatile. It generally is considered the universal pump, as it can usually be used for any pump application. A diaphragm pump is capable of handling sticks, stones, mud, trash and other large debris. Basically, anything that can fit through the opening will be able to go through without damaging the pump. It will pump seawater;

recirculated water; and muddy, sandy or viscous water.

Despite its universal appeal, the diaphragm pump also is the most expensive kind, therefore, most users only choose it if it is the only pump that will work. Additionally, diaphragm pumps operate at a much slower rate than centrifugal units, so speed is another factor that must be taken into consideration.

Unlike the standard centrifugal, semi-trash and trash pumps, the diaphragm pump does not have an impeller that rotates the water within the pump. Diaphragm pumps have two chambers, and work using an action similar to that of an internal combustion engine. As the volume in one of the chambers is increased, the pressure in the other decreases, drawing in fluid. This fluid later is forced out once the pressure in that chamber is increased, and the process is repeated.

Quality Counts

While it is important to determine the type of pump needed for a specific application and water type, it is only one part of the overall selection process. Just as important is the ability to identify the characteristics of a well-built, quality pump.

First, consider the pump's engine. While the construction of the rest of the pump is equally important, the pump will not operate properly without an adequate engine. Look for one from a reputable manufacturer. Also, be sure the engine comes with a good

PUMPSELECTION



A worn seal can cause unwanted air to enter the pump and keep it from operating. Mechanical self-lubricating seals (left) help prevent this problem. A cast-iron impeller (center) is one sign of a quality pump. Heavy-duty materials are especially important in pumps that handle debris. A metal strainer (right) will keep oversized debris from entering the intake hose.

warranty, and that parts are easy to find if there is a problem with them in the future. Luckily, most of the maintenance on a pump engine is preventative, and simple care usually extends the life of the engine and pump as a whole. Generally, quality pump engines can be expected to last for more than 2,500 hours of operation, and sometimes more if the recommended maintenance is followed.

Pump owners should regularly change the oil and air filter, and keep the spark plugs clean. Inquiring about this and other suggested engine maintenance is an important step in selecting the right pump.

Just as important as the engine are the pump housing and inner components of the pump. This is especially true on semi-trash and trash pumps, as these are more likely to handle debris and corrosive materials that can wear out the pump prematurely.

Two of the most important parts to check before purchasing a pump are the mechanical seals and the impeller. These are extremely important, because they are generally the first two parts to break down if and when there is a problem.

The mechanical seal protects the impeller from wear and can greatly increase overall pump life. Quality centrifugal pumps generally have

self-lubricating carbon ceramic mechanical seals, and semi-trash and trash pumps have self-lubricating silicone carbide seals. These are said to be the best seals to combat the wear caused by repeated use, and keep the pump from leaking. As these seals wear down, the impeller becomes more vulnerable to wear, and the probability of the pump leaking increases. Over time, this can cause unwanted air to enter the pump, and keep it from running altogether.

Final Takeaways

Another key component to look for is a cast iron impeller, which is usually a sign of a well-built pump. Again, this is particularly important in pumps that will be frequently transporting solids, as this is the main cause of wear on the pump. The impeller on some models is plastic, and does not stand up well over time. Additionally, when buying a trash pump, the consumer should make sure that the pump has a wear plate, which acts as a buffer between the impeller and volute. It prevents solids from passing through the pump, and is not standard on lower-quality pumps.

The pump housing itself also is available in a variety of different materials. Higher-quality housings are made of stainless steel, or in the most sturdy pumps,

die-cast aluminum. While this type of pump housing may cost slightly more, the extended life it will afford the pump will more than make up for the money saved by buying a plastic housing.

Another important part in all pumps is the strainer. This part has a series of holes (with different sizes depending on pump type) and keeps oversized debris from entering the intake hose and causing damage to the pump. A prospective buyer always should look for a metal strainer, as the plastic pieces will usually crack or break over time, and will not keep unwanted debris out of the pump hoses, causing them to become plugged.

Just as with standard pieces of construction equipment like air compressors, excavators and light towers, pump quality can vary greatly from one to the next. Although pumps are typically used for one simple task—moving water from point A to point B—selecting a quality pump is a wise investment that will bring dependability and a greater return over time. **PS**

Pam Meyer is equipment sales manager for Subaru Industrial Power Products. Meyer can be reached at pmeyer@robinamerica.com or 847.847.2963.

For more information, write in 1202 on this issue's reader service form on page 18.