

What is a pump casing?

A pump is a mechanical tool that provides sufficient pressure to move a liquid through a system at a desired flow rate. Therefore, it is a means of converting mechanical work into fluid energy. Pumps can be broadly classified into centrifugal pumps and positive displacement pumps. Centrifugal pumps are by far the most widely used pumps.

pump casing

What is a pump casing?

Simply put, the pump casing is a casting that holds the pump in place. Pumps can be very tiny or huge. But the main function of all pumps, big or small, is to accept fluid through the inlet and send it out through the outlet after increased pressure. A casing pump is a casing that connects all the parts that make up the pump's work. The pump casing is very important wherever the pump is exposed. A good example of a need for a solid pump casing is a submersible pump.

The pump casing is one of the most expensive pump components and must be chosen carefully. Choosing the correct pump casing directly affects reliability and uptime. A properly handled pump casing also plays an important role in improving its performance. In many systems, pumps receive very hot or very cold fluids. Therefore, the choice of material is also important.

Pump casing casting

The pump casing contributes significantly to the pump cost. Cast casing pumps face various challenges. One of the most important challenges is fluid-induced corrosion. When throwing a pump casing, the manufacturer must ensure that the casing walls are strong enough to withstand the pressure and pressure exerted on the pump. Foundry manufacturers also need to ensure casing cast pumps are corrosion resistant. The pump casing diameter must be large enough to accommodate a pump with sufficient permits for efficient installation and operation.

material used for pump casing

Ductile iron is one of the most popular casting materials for pump casings. However, they can also be made of cast iron or grey iron. Cast iron homes mostly tend to withstand wear and tear well, requiring more infrequent replacements.

Typically, after a cast pump casing manufacturer receives a CAD image, the mold is made from the material required for the casing and cast to the required tolerances.

Shell Pump - Test

Due to the nature of these components, a lot of wear occurs on the pump and pump chamber. Therefore, it is important to test these two entities for fatigue, corrosion and thickness reduction. There are regular laboratory tests for pump casings.



What is a Pump? Maybe it is a simple question. Maybe it is a highly complex question. To say simple, it is a concept only. To say complex, because its range is too huge and wide. This article is the fullest introduction to the topic of [what is a pump](#).

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What is a Pump?

A pump is a machine that pressurizes by some mechanism (usually a reciprocating or rotary type), transporting fluid from a low level (low pressure area) to a high level (high pressure area). Pumps can only transport substances with fluid as a medium, not solids. Fluids include water, oil, acid base liquid, emulsion, suspension, liquid metal and other liquids, and can also transport gas.

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As a machine, a pump can be powered by a variety of energy sources. Such as physical operations, electricity, motors or wind. Meanwhile, pumps include a variety of sizes, from microscopic pumps to various large industrial pumps. Regardless of the size of the pump, all pumps deliver fluid from the pump's inlet to the pump's outlet by increasing pressure.

The structure of the pump is also not complicated. For example, a centrifugal pump is mainly composed of a pump body, an impeller, a sealing ring, a rotating shaft, a shaft seal box and other components. Each part can be finished by casting process, then assembled into a complete pump.

As a foundry, many of its ASTIG's castings are pump castings. We also introduce lower pumps based on our pump casting experience.

The main function of the pump

As a common machine, the function of the pump includes the following aspects:

- Transport fluids from low-pressure areas to high-pressure areas.
- Circulate fluid from one point to another.
- Can be used to increase the flow rate of the transport fluid.
- It increases the pressure or head of the pump to meet the required discharge pressure requirements.
- When the system loses pressure, a pump can be used to increase the pressure of the system to stabilize it.

The main performance parameters of the pump

The main performance parameters of the pump are flow rate, lift, shaft power, necessary NPSH, speed, etc.

(1) The flow rate of the pump

The quantity of liquid provided by the pump per unit time, there is volume flow Q , the unit is m^3/s ; there is mass flow G , the unit is kg/s .

(2) The lift of the pump

Lift is the energy increment per unit weight of the liquid transported from the pump inlet to the outlet, usually expressed in H . The unit is m . Taking the water pump as an example, the lift of the water pump refers to the height at which the water pump can lift water.

(3) The shaft power of the pump

Shaft power is a term often used on pumps. It refers to the work given to the pump shaft per unit time under a certain flow and head. It is represented by P and the unit is kw .

(4) Speed

The number of revolutions per minute of the pump, represented by n , in r/min .

(5) NPSH

The NPSH must be related to the internal flow of the pump, it is independent of the device parameters. It indicates the degree to which the pressure of the liquid drops in the inlet part of the pump. That is to say, in order to prevent cavitation of the pump, it is required that the unit weight of the liquid at the pump inlet has excess energy exceeding the vaporization pressure head. The smaller the required NPSH, the better the pump's cavitation resistance.

There is an interdependent relationship between the various performance parameters of the pump. And the viscosity of the liquid conveyed by the same pump is different. The relationship between its performance parameters will also change.

For example, a power pump, as the viscosity of the liquid increases, the lift and efficiency of the power pump decrease, and the shaft power increases. It is also for this reason that in order to improve the conveying efficiency in the industry, the liquid with high viscosity will be heated to reduce the viscosity.

Classification of pumps

There are many types of pumps, and there are many ways to classify them. For example

- According to the working principle: positive displacement pump, dynamic pump and other types of pumps.
- According to the nature of the conveying fluid: water pump, oil pump and mud pump.
- According to the driving method: electric pump and hydraulic pump.
- According to the structure with or without shaft: linear pump and traditional pump.
- According to the structure: single-stage pump and multi-stage pump.
- According to the application: boiler feed pump and metering pump.

Although there are many types of pumps, the most commonly used are positive displacement pumps and power pumps. At the same time, there are many types of positive displacement pumps and dynamic pumps. The following types of pumps are described in detail.

Positive displacement pump

The positive displacement pump uses the reciprocating or swirling motion of the working parts in the pump cylinder to periodically increase and decrease the working volume to suck and discharge liquid. The positive displacement pump mainly increases the pressure of the liquid through the extrusion of the working parts.

There are also many types of positive displacement pumps. Such as reciprocating pumps, rotary pumps, diaphragm pumps, piston pumps, plunger pumps, gear pumps, screw pumps and water ring pumps (water ring vacuum pumps).

Reciprocating pump

A positive displacement pump in which the working parts reciprocate in the pump cylinder is called a reciprocating pump. The suction and discharge processes of the reciprocating pump are alternately performed in the same pump cylinder. And controlled by a suction valve and discharge valve.

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The main features of the reciprocating pump are:

- Can reach very high pressure, and the pressure change hardly affects the flow. Because of this feature, the reciprocating pump can provide constant flow.
- The reciprocating pump has self-priming ability, can deliver liquid and gas mixtures. Specially designed reciprocating pump. It can also transport mud, concrete, etc.
- The flow and pressure of the reciprocating pump have large pulsation, especially the single-acting pump. Double-acting pumps and multi-cylinder pumps can be used to improve flow unevenness.
- The speed of the reciprocating pump is low and the size is large. The structure is complex and requires a special pump valve.

Rotary pump

The rotary motion of the working parts in the pump cylinder is called a rotary pump. The rotary pump sucks fluid through the rotation of working parts such as gears, screws, and vane rotors. Finally, the fluid is squeezed to the discharge pipe and output. Most rotary pumps are used to

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