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GRI PUMPS
A GORMAN-RUPP COMPANY
The Pump People

Flooded Suction
Starved Suction
simplified

What is flooded suction?

Simply put, flooded suction is when the fluid supply to the pump is above the pump's suction port. When the fluid that is pumped originates from above the suction port of the pump, the power of gravity will cause the fluid to fill the cavity of the pump. Placing the pump within the fluid itself is also considered flooded suction.

Not placing a centrifugal pump in a flooded suction environment will cause the pump to fail.

Why is flooded suction required for a centrifugal pump?

Centrifugal pumps, such as our Integrity Series, contain interior parts that spin at high RPMs. The spinning parts, that is the impeller and impeller shaft, work to move the fluid contained within the pump out and through the discharge port of the pump. This spinning produces friction and friction produces heat. With flooded suction, when power is supplied to the pump, it will begin spinning with fluid already present within the pump cavity. This fluid will provide a lubrication that assists in reducing the friction and heat.

Attempting to operate a centrifugal pump in a non-flooded suction environment, or in other words, zero fluid in the pump is called Dry Run. Dry running a pump will cause the pump to fail due to overheating. This, in most cases, will destroy the pump in only a few seconds.

Another thing to consider is something called starved suction.

What is Starved Suction?

This happens when the NPSHa or Net Positive Suction Head available does not meet or exceed NPSHr Net Positive Suction Head required. In a less technical way of putting this, the discharge side of the pump is attempting to produce more than the pump can take in on the suction side. Even though the pump is in a flooded suction environment, there may not be enough fluid to keep up with the designed performance of the pump. As mentioned earlier, the lack of fluid will cause the pump to overheat and eventually burn up.

Starved suction can also cause a phenomenon known as cavitation. Cavitation, which can be a subject of its own, will also destroy a pump.

DO NOT RUN DRY

Before shipping a pump to our customers, a label is applied to each pump that contains specific information about the pump. Centrifugal pump labels also contain a warning which reads, DO NOT RUN DRY.

Hopefully this warning will remind customers of the importance of supplying an adequate amount of fluid to centrifugal pumps before startup.

Much to consider

There is much to consider when sourcing a pump. Since 1953, GRI's success has been built on solving problems like what has been discussed in this article. We welcome the opportunity of being your fluid pump champion.

GRI collaborates with OEM engineers who are unable to fulfill their unique fluid pump requirements with an off-the-shelf solution and demand a custom-engineered pump specific to their application.

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