

FLOODED SUCTION VS. STARVED SUCTION

Understanding Why Proper Pump Supply Matters

A centrifugal pump is only as reliable as the fluid supplied to it. Understanding the difference between flooded suction and starved suction can help prevent overheating, cavitation, and premature pump failure.

What is Flooded Suction?

Flooded suction occurs when the liquid source is positioned above the pump's suction inlet. Because gravity naturally feeds liquid into the pump, the pump casing remains full of fluid before startup.

Benefits of Flooded Suction

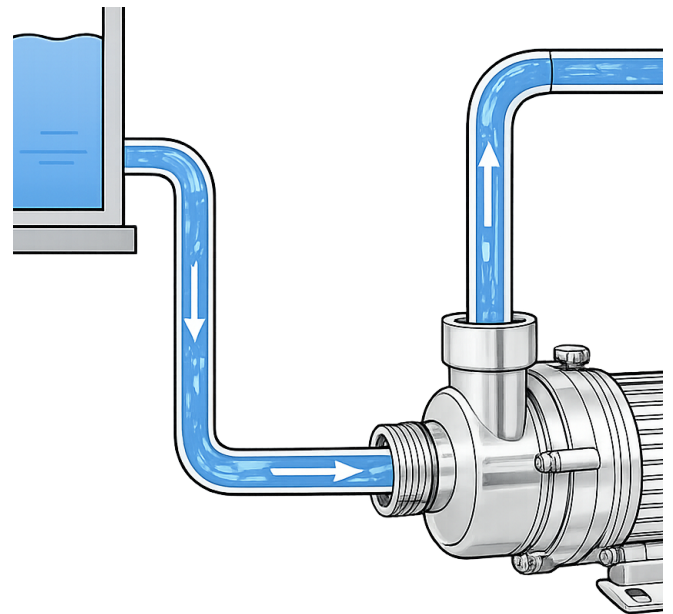
- Pump is primed before startup
- Continuous fluid supply
- Reduced friction and heat
- Longer pump life

Important: A centrifugal pump should not be operated without fluid. Running dry can quickly destroy the pump.

Why Do Centrifugal Pumps Need Flooded Suction?

Inside every centrifugal pump, the impeller rotates at high speed.

- There is no lubrication
- Friction rapidly increases
- Heat builds almost immediately
- Internal components can fail within seconds



What is Starved Suction?

Starved suction happens when the pump does not receive enough incoming fluid to meet its operating requirements. This occurs when the available Net Positive Suction Head (NPSHa) is lower than the pump's required NPSHr. Although the pump may still be operating, it cannot receive enough liquid to maintain proper performance.

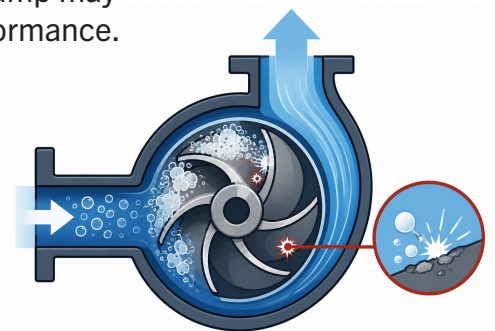
Common Results of Starved Suction

- Reduced flow
- Loss of performance
- Overheating
- Increased wear
- Pump damage

One of the biggest risks is **cavitation**.

Cavitation Can Lead To:

- Pitted impellers
- Excessive vibration
- Noise
- Reduced efficiency
- Premature pump failure



What is Cavitation?

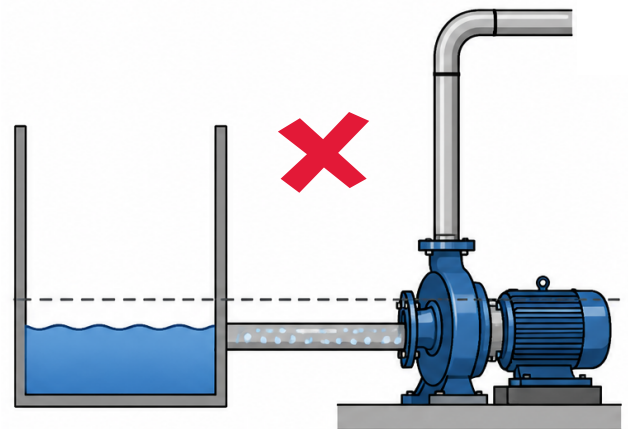
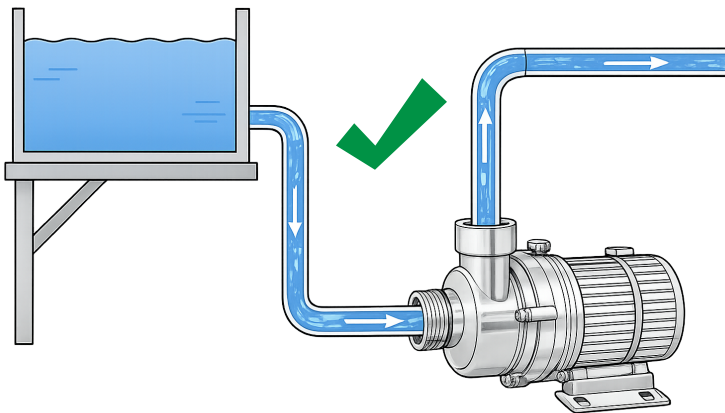
Cavitation occurs when low pressure causes vapor bubbles to form inside the pump.

As these bubbles collapse, they create powerful shockwaves that can damage internal pump components.

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Key Takeaways

Flooded Suction	Starved Suction
Liquid level is above the pump	Pump doesn't receive enough liquid
Pump starts fully primed	Pump struggles to maintain flow
Helps cool and lubricate the pump	Can cause overheating
Improves reliability	May lead to cavitation and pump failure



Choosing the Right Pump Matters

Every application has unique fluid handling requirements.

Since 1953, GRI has worked with OEM engineers to solve challenging pumping applications by providing both:

- Standard pump solutions
- Custom-engineered pump designs

Selecting the correct pump configuration can improve reliability, reduce downtime, and extend equipment life.

Every GRI centrifugal pump is labeled:
DO NOT RUN DRY

This warning exists for a reason. Always ensure an adequate supply of fluid reaches the pump before startup and throughout operation.

When a pump spins without adequate fluid, it is called **running dry**.

Running Dry Can Cause:

- Overheating
- Seal damage
- Bearing failure
- Complete pump failure