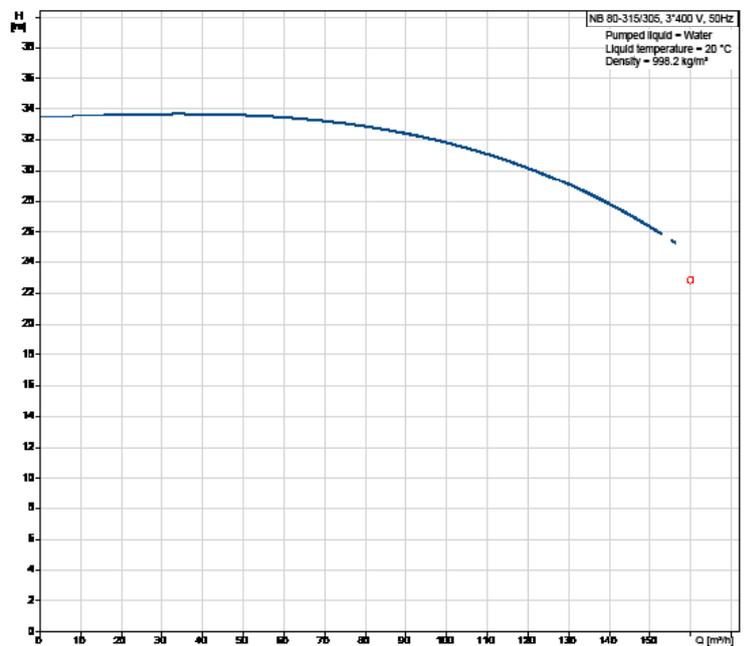
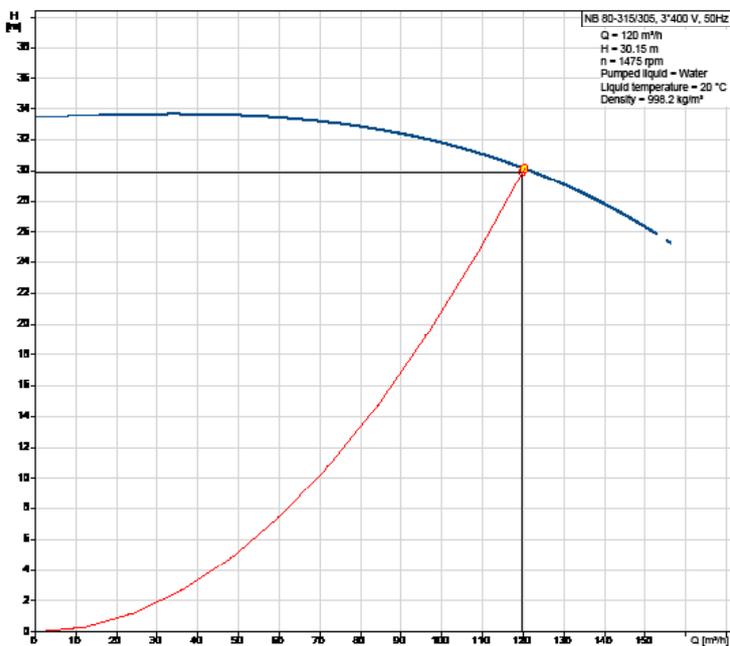


What is Cavitation?

Cavitation is when there is insufficient water available for a pump to meet the flow requirements of the system. This can occur when the pump cannot make sufficient discharge pressure to meet its manufacturer's specification. It often occurs in process pumps where there is varying demand on the pumps, and typically in a chilled water system or a heating system.

On the graph below we are showing the volume pumped (Q) plotted against the pressure produced (H). The blue line shows the capability of the pump. In the example below we show the pump producing 120 m³/h at 30m pressure. If the demand increases 150 m³/h then the pump will run off this curve which will result in cavitation. See the lower graph.



What happens is that the pump sucks the air out of the water, the air implodes causing high temperature and high pressure on a microscopic scale; the shock waves cause damage to the seal and bearings.

How can I tell if I have suction cavitation?

If you have a pump which fails more frequently than every 12 months, where either the mechanical seal fails, or the front motor bearing fails, it is highly likely that you have a measure of cavitation. If you were to look inside the pump, the impeller would look as if it had been attacked by chemical; it would have suffered from erosion.

Cavitation is more noticeable on larger pumps; a cavitating pump is normally noisier than you would expect.



What is Cavitation?

The Problem:

If you are experiencing cavitation within your pumps, the first sign will be leaking from the mechanical seal, or that the front bearing will seize and stop the pump operating. Ultimately, if cavitation is occurring, the pump will fail.

QUICK CHECK:

If you want to test to see if your pump is cavitating, you can slowly close your discharge valve. If you hear the noise reduce, this is a good indication that the pump may be cavitating.

Typical causes of cavitation are:

1. Blocked filters on the suction side of the pump
2. Restrictions in the suction pipework
3. Pump is drawing water from below the pump (especially where the water temperature is over 50°C.) This temperature might be lower than you'd expect, but as you reduce the pressure on heated water (by suction), the boiling point is reduced allowing it to vaporise at a lower temperature.
4. Discharge pressure drops below the minimum pressure the pump is designed to produce, which is normally a result of excessive demand for water.
5. Designed set flow rate is exceeded by the user.
6. Low water level in the suction tank.

Common applications where cavitation is found:

- Swimming pool pumps
- Process pumps
- Chilled water supply pumps

The Solution:

The solution to pump cavitation is:

1. Analyse where the pump is performing
2. Assess what the demands of the system actually are
3. Adjust the valves and filters to suit the system
4. Alternatively, install the correct specification of pump. In many cases the pump specification is either too small or the duty that has been selected doesn't cover the full range of requirements under which the pump has to operate. Typically a larger pump is required.

If you suspect that you have cavitation, Dura Pump will carry out a full system analysis and assessment of your pumps to help you identify your problem. With our extensive knowledge and expertise, backed by specialist engineering software, we are able to provide you with the right and most cost effective solution. It is important to note that cavitation not only breaks pumps, but also wastes energy and money.

Example:

Dura Pump received a call from a school for disabled children whose maintenance team were repeatedly replacing the motors of their swimming pool pumps every nine months.

Having carried out a full analysis, Dura Pump found the pumps were producing too much pressure and insufficient flow. Following careful pump selection, we installed three replacement pumps. These KSB Etabloc pumps have run consistently for 3 years without a single failure.

With our complimentary service of making energy savings for our customers, our selection resulted in the school saving two kilowatts of energy per hour. A grand saving of 17,520 kilowatts per year has been added on to the savings of no pump repairs. The reduced noise and the increased reliability of the pumps has given another Dura Pump customer total confidence in their system.



New Pumps



Old Pumps