Project Report;

2PBA Super and High Speed Optimization for Pumps

Date: 01.02.2026

Regarding series: 2PBA,2PE,2PS,C-2PE,C-2PS (12-108)

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1. Introduction and Aim

This report summarizes the optimization outcomes of our transition to "Super" versions of our current pump designs. Our primary focus is on improving operational stability at high speeds and perfecting suction characteristics while minimizing the risk of cavitation.

2. Technical Problem Analysis

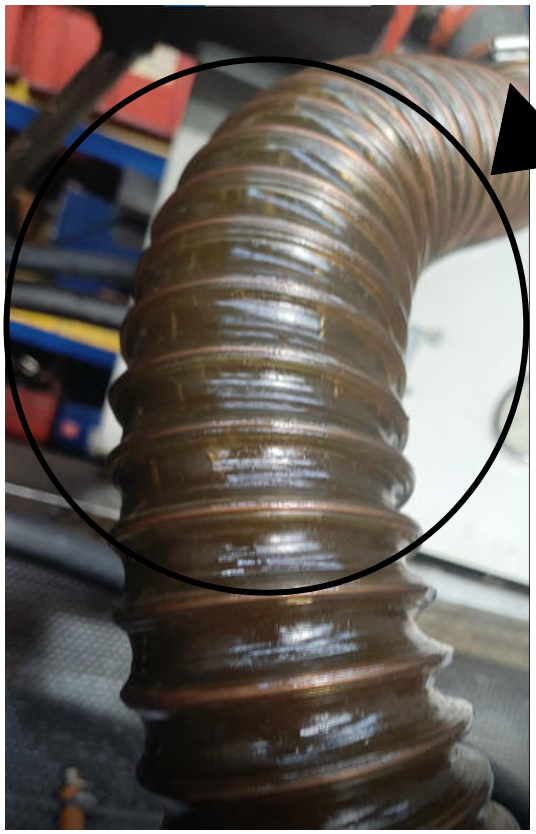
High-speed operating conditions present two main challenges in hydraulic pumps:

-High Suction Requirement: Vacuum losses that may occur during the high-speed transport of fluid.

-Mechanical Stress: The thermal and physical load on the internal components of the pump as the speed increases, combined with the cavitation effect, accelerates wear.

3.1. Cavitation Management

With improvements made to the pump, fluid inlet velocities have been optimized and turbulence minimized. This prevents the formation of microscopic bubbles (cavitation) that cause metallic erosion, even at high speeds.



To create the most disadvantageous conditions, the pump is positioned higher than the insufficient capacity tank level and the suction connections are placed at an angle. (90 degree fitting used)

Image 1: Standard 2PBA Series

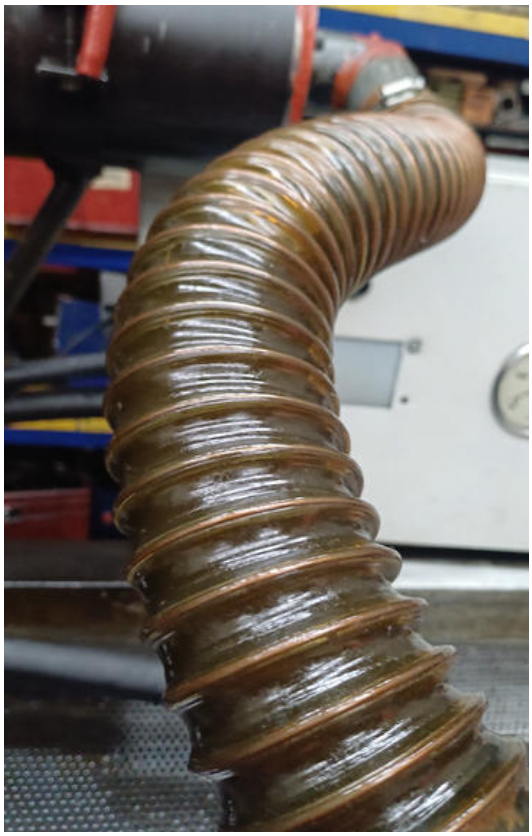


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Image 2: 2PBA Super Series

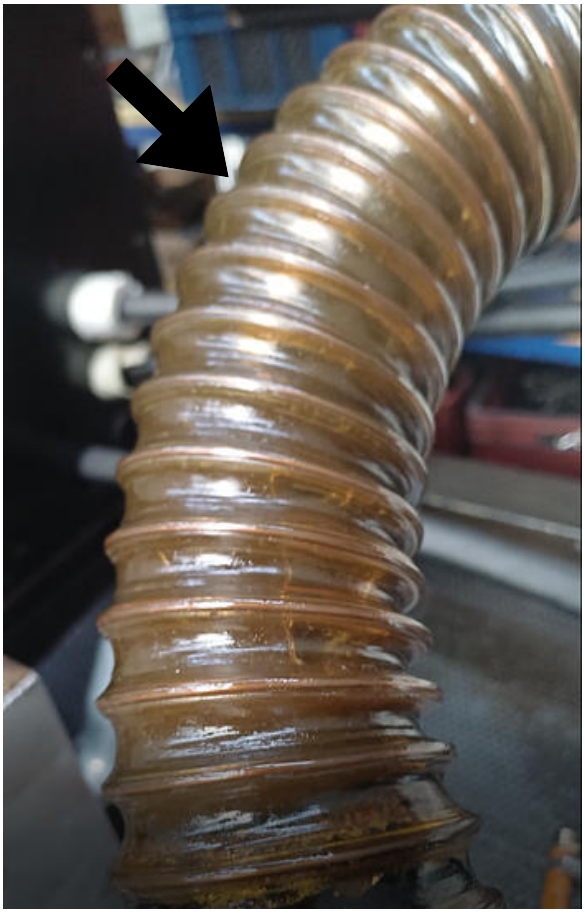


Image 3: Standard 2PBA Series
Angle 2

No efficiency loss is recorded and the volumetric efficiency remains the same with 98% even at lowest RPMs (measured with drainage test)

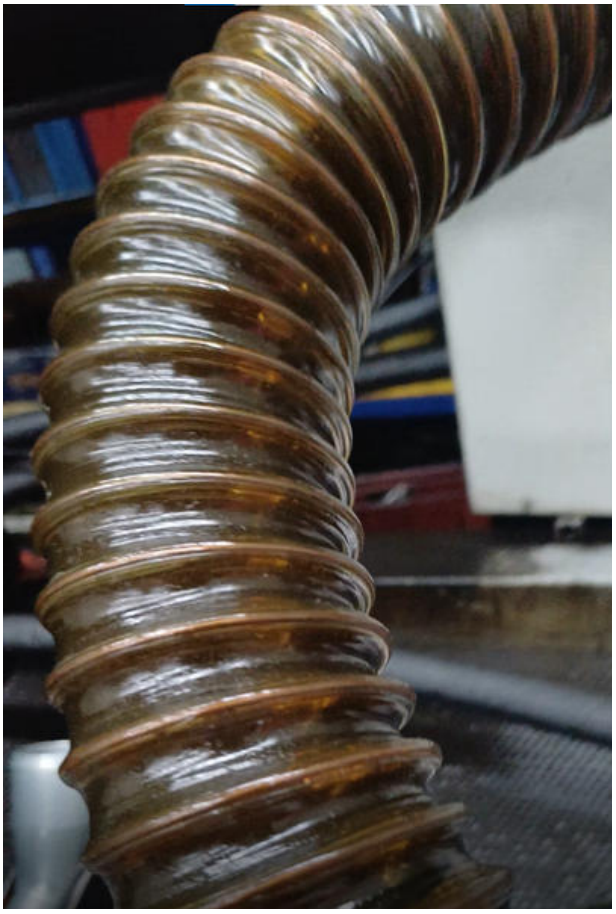
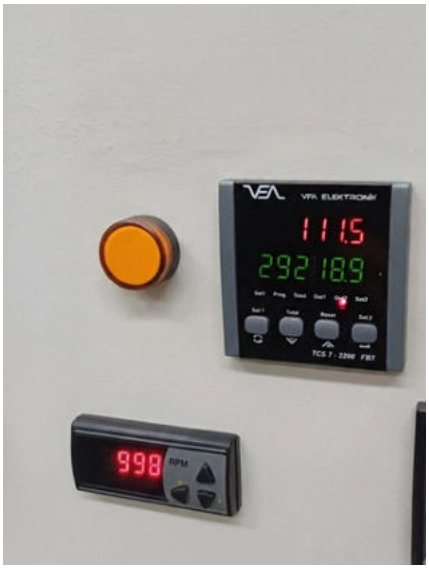


Image 4: 2PBA Super Series
Angle 2

3.2. Suction Performance

As a result of the optimizations made, an increase in the "idle suction/flow" capacity of the pump has been recorded.

108.2 → 111.5 at 1000rpm (3% increase)



4.Customer-Specific Configuration Note

At Hidrocel Hydraulic, we base our standard production on "High Efficiency" parameters. Hidrocel Hydraulic prioritizes high safety in its sealing strip design. Therefore, sound optimization is performed in two stages.

NOTE: For a wide range of applications, Hidrocel Hydraulic offers 2 sound optimization options. If the customer wants aggressive noise optimization, they can choose option 2. Hidrocel Hydraulic will calibrate to the highest performance values.

-There is no price difference between options 1 and 2.