

## Treatment of excessive gear wear in p330 gear pumps

Gear wear is the most common type of gear pump failure, which directly shortens equipment life and reduces system efficiency. In this article, In this article you will learn how to deal with excessive gear wear on a [p330 gear pump](#).

### 1.The main reasons for rapid gear wear

#### (1) lubrication failure

Pollution control: excessive particulate matter in the lubricant will form abrasive wear.

Viscosity matching: high temperature oil viscosity drop of more than 30%, the oil film thickness is not enough to trigger dry friction, low temperature solidification will intensify the start-up wear.

System defects: irrational design of oil circuit leads to local oil pressure insufficiency, experiments show that when the lubrication pressure is lower than 0.3MPa, the wear rate increases by 2 times.

#### (2) Technical bottlenecks in design and materials

Tooth shape optimization: involute tooth shape is prone to stress concentration at the meshing point, the use of double arc tooth shape can reduce the contact stress by 40%.

Gap control: axial clearance increases by 0.01mm, the volume efficiency decreases by 1.5%, and the leakage worsens, resulting in deterioration of lubrication.

#### (3) The superimposed influence of working conditions and environment

Load fluctuation: when the dynamic load exceeds 30% of the rated value, the rate of expansion of tooth fatigue cracks increases by 3 times.

Temperature shock: high temperature  $> 120^{\circ}\text{C}$  when the oil film rupture, a metallurgical equipment failure rate increased by 40%; low-temperature start-up without preheating leads to dry friction risk increased by 5 times.

Medium corrosion: in  $\text{pH} < 5$  or  $\text{pH} > 9$  environment, the corrosion rate of stainless steel gears can reach 0.1mm/year.

### 2.Detection methods

#### (1) On-site quick judgment

Abnormal noise (abnormal frequency of wear gear meshing)

Oil contains metal debris

System pressure fluctuation (fluctuation  $> 10\%$  rated value)

#### (2) Professional testing methods

Infrared thermography to monitor the temperature field (local temperature difference  $> 15^{\circ}\text{C}$  suggests wear)

Vibration spectrum analysis (characteristic frequency amplitude exceeds the diagnostic wear stage)

### 3.Restoration Program

#### (1) Emergency repair

Gear flip method: applicable to single side wear  $< 0.3\text{mm}$  gear.

Laser cladding: the hardness after repair can reach HRC55+, but need to control the heat-affected zone  $< 0.5\text{mm}$  to avoid deformation.

Gap compensation: every 0.1mm increase in the thickness of chrome plating layer, the need to re-adjust the end face gap to ensure sealing.

#### 2. Long-term improvement measures

Intelligent lubrication: automatically adjust the viscosity according to the oil temperature.

Asymmetric tooth shape: optimized flow pulsation is reduced by 40%, and contact stress is distributed more evenly.

The above is the treatment of [p330 gear pump](#) gear wear too fast, I hope it can help you, if you want to know more professional knowledge or buy related products, please go to our official website.

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