

## **P50 Gear Pump: Designed for High-Flow, Heavy-Duty Applications**

Within the realm of hydraulic transmission, different gear pump models fulfill distinct missions. Some applications demand compact pump bodies for streamlined installation layouts, while others require pumps capable of higher pressure ratings and greater flow output. The [P50 gear pump](#) series from Runhe Hydraulics was developed precisely to address these demanding requirements. Building upon the inherent reliability of gear pumps, this pump achieves comprehensive enhancements in displacement specifications and load-bearing capacity.

Visually, the P50 pump appears substantially more robust than smaller displacement models, featuring thicker casing walls engineered through precise calculations. This structural reinforcement is not merely dimensional scaling but a targeted design addressing stress conditions. As displacement increases, gear diameters expand, meshing forces rise, and internal pressure loads on the casing significantly intensify. The P50 pump housing is cast as a single piece from high-strength cast iron. It undergoes thorough stress-relief aging treatment to eliminate internal stresses, delivering outstanding rigidity. During continuous operation under high-pressure conditions exceeding 20 MPa, housing deformation is strictly controlled within design limits.

Reviewing the P50 pump's technical specifications reveals its broad displacement coverage. From models for precise low-flow control to specifications for rapid high-flow response, it forms a complete product series. This means suitable matching specifications can be found within the P50 series for both hydraulic presses requiring high pressure and low flow, and material handling equipment needing low pressure and high flow. Many equipment manufacturers select the P50 pump as their preferred platform during new model development, pairing pumps of different displacements with a single hydraulic system design, significantly simplifying the complexity of selection work.

The gear design of the P50 pump embodies the technical expertise accumulated by Runhe Hydraulic's R&D team. Gears are forged from high-strength alloy steel blanks, undergo normalizing treatment to refine grain structure, followed by rough and finish machining. The tooth profile is not a simple involute curve but a specially optimized profile derived through computer simulation. This design ensures more stable contact during gear meshing, reduces oil trapping, and minimizes pressure pulsation amplitude. The gear surfaces undergo carburizing and quenching treatment, achieving a hardness exceeding HRC 60 for outstanding wear resistance. Even when operating fluids contain a certain amount of particulate impurities, gear surface wear rates remain low.

The bearing system represents a key technological highlight of the [P50 gear pump](#). Bearings in high-displacement pumps typically endure higher loads, where traditional sliding bearing structures may struggle to meet long-term reliability demands. The P50 employs reinforced DU bearings with enhanced load-bearing capacity. These bearings feature a wear-resistant material layer bonded to a copper substrate, enabling them to withstand substantial radial forces while maintaining self-lubricating properties. Paired with the pump's meticulously designed internal pressure lubrication channels, this ensures no direct metal-to-metal contact occurs on bearing surfaces—even under conditions of low oil viscosity or during startup when oil pressure is not yet fully established. Numerous customers using the P50 pump in mining equipment report that bearing service life consistently exceeds expectations, even under severe vibration and impact conditions.

The P50 pump's side plate design also merits attention. During operation, high-pressure oil tends to leak through the gap between the gear end faces and side plates. Minimizing this gap enhances volumetric efficiency, but overly tight assembly risks abnormal wear. The P50 employs a floating side plate structure, introducing high-pressure oil to the plate's rear as a compensating force. As operating pressure increases, the side plate is pressed more tightly against the gear end face, automatically compensating for wear-induced clearance. This design enables the P50 pump to maintain high volumetric efficiency even after prolonged use. Many pumps disassembled for inspection after three to five years of operation show performance degradation within acceptable limits.

Sealing system reliability is critical for gear pumps. The P50 pump employs a dual-seal structure at the mating surfaces between the front and rear covers and the housing. An O-ring provides the primary seal, while a sealing gasket serves as secondary assurance, preventing high-pressure oil leakage from the joints. The high-pressure oil seal at the main shaft extension employs an imported double-lip skeleton seal. The primary lip seals the oil, while the secondary lip prevents external dust ingress. Numerous P50 pumps operating in high-dust environments like cement mixing plants or ceramic factories accumulated thick layers of dust on their casings after one to two years of operation. However, the oil seal areas remained clean, showing no signs of leakage.

The P50 pump manufacturing process follows a proven and reliable workflow. Housing machining is completed in a single setup on large machining centers, ensuring precise positioning accuracy for front/rear faces and bearing bores. Gear grinding is performed on high-precision form grinding machines, controlling tooth profile errors to the micrometer level. The contact pattern distribution of each meshed gear pair undergoes rigorous inspection and must meet design specifications before proceeding to assembly. In the assembly workshop, operators assess each pump's rotational flexibility by feel. The main shaft must rotate smoothly and uniformly without any binding. Only products meeting these standards receive final approval for shipment.

The P50 pump continues to expand its market applications. In construction machinery, it powers the travel mechanisms and slewing systems of numerous medium-sized excavators, earning user recognition for its responsive performance and smooth operation. In metallurgical machinery, continuous casting production lines utilize the P50 pump as the primary pump in hydraulic stations, operating continuously for months without shutdown while maintaining stable performance. For mining machinery, the hydraulic systems of underground auxiliary transport vehicles demand exceptional reliability. The P50 pump has proven resilient in such environments, withstanding challenges from humidity, dust, and voltage fluctuations. In petroleum machinery, the hydraulic systems of certain workover equipment require high-flow support, where the P50 pump also delivers satisfactory performance.

Demand for the P50 pump in agricultural machinery has shown a steady annual growth trend. Large silage harvesters, cotton pickers, and hay balers all require substantial hydraulic oil flow to drive their working mechanisms. The P50 pump delivers sufficient flow output while maintaining high operational efficiency, enabling agricultural machinery to maximize productivity during peak seasons. In large-scale farms across Northeast China and the Xinjiang Uygur Autonomous Region, our pumps operate continuously alongside agricultural equipment in the fields. Operators consistently report that Runhe pumps run reliably and stably, requiring minimal attention.

As a core enterprise under Hanjiu Technology Group, Hebei Runhe Hydraulic Machinery Co., Ltd., headquartered in Qiaoxi District, Shijiazhuang, has dedicated years to technical advancement and manufacturing in hydraulic components. Its production base possesses an annual processing capacity exceeding 300,000 hydraulic components, with rigorous quality control systems established across all stages from raw material intake to finished product shipment. The technical team comprises dozens of experienced engineers with deep expertise in material heat treatment processes and friction pair matching. Building on this technical foundation, the company's products have obtained CE certification and consistently demonstrate their capabilities at domestic and international industry exhibitions. Runhe Hydraulics will continue to uphold a pragmatic approach, delivering reliable products to meet the hydraulic power demands of diverse equipment.

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enerpac p50 pump

p50 hydraulic pump

p50 series pump

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parker p50 pump

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