



Lawrence Pumps® VPL3600 Maze Pump

ISO 13709/API 610 (VS4) lineshaft sump pump for coke slurry service



The Lawrence Pumps VPL3600 maze pump from Flowserve isn't your typical lineshaft pump; it's more. With its rugged ISO 13709/API 610 (VS4) compliant construction, slurry wet end and protected sleeve bearings, the VPL3600 maze pump is specifically designed for the tough slurries of coke pits. Every aspect of the pump is engineered to minimize the destructive effects of abrasive solids while maintaining the highest possible hydraulic efficiency. The result is a pump with a typical mean time between repair (MTBR) of five years.

Slurry tough

While not typically labeled a critical service, coke pit pumps must operate reliably with minimal maintenance. This is an extremely difficult task when handling high volumes of abrasive coke fines.

The VPL3600 maze pump is engineered to overcome the common challenges confronting decoking operators.

- Prevents accumulation of coke solids around the pump suction strainer
- Reliably handles both routine and upset slurry conditions
- Protects shaft and sleeve bearings from abrasive solids
- Mitigates bearing damage caused by excessive axial and radial load forces

Application-driven design

The Lawrence Pumps VPL3600 ISO 13709/API 610 (VS4) vertical lineshaft slurry pump is specifically designed for coke pits in hydraulic decoking units. With its high chrome iron wet end, slurry hydraulics, protected sleeve bearings and sparger system, the VPL3600 maze pump is a proven performer in applications containing abrasive solids.



Operating parameters

- Flows to 1500 m³/h (6600 gpm)
- Heads to 150 m (492 ft)
- Temperatures to 100°C (212°F)
- Speeds to 1800 rpm

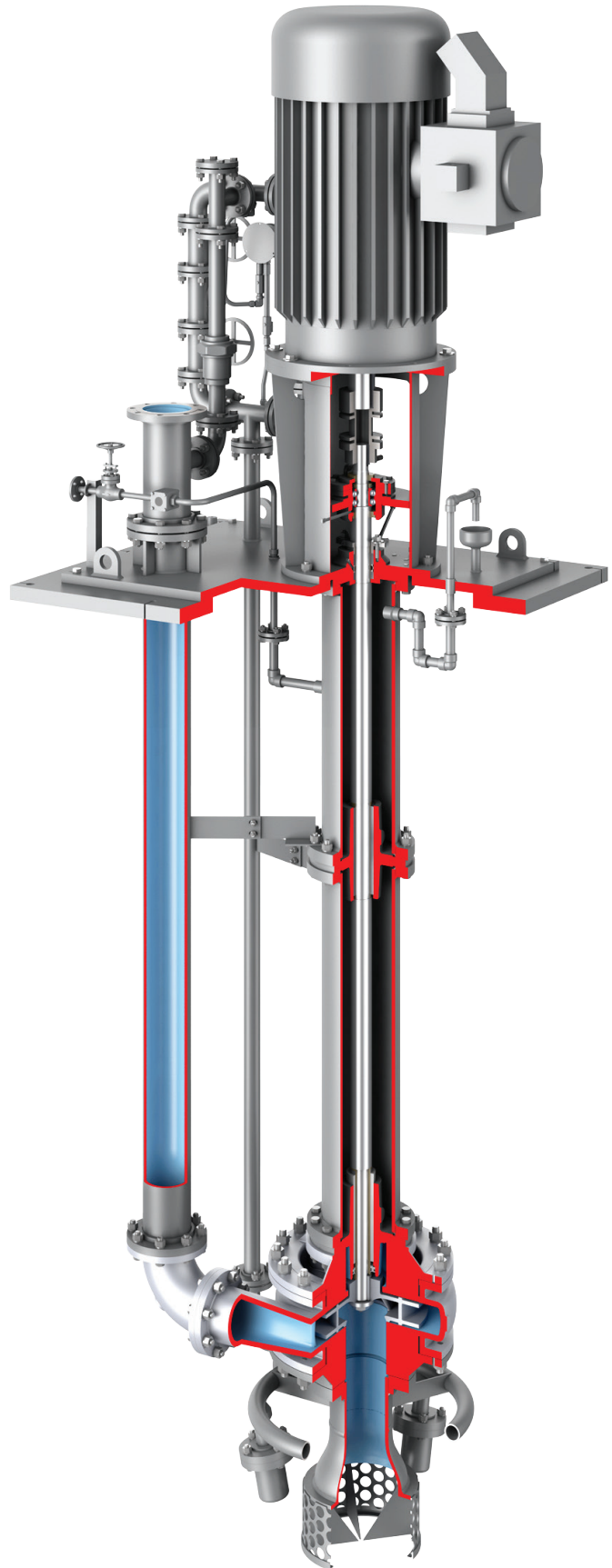
Special construction is available for conditions exceeding the above parameters.

A proven and complete system

More than 160 refineries around the world rely on Flowserve for their hydraulic decoking systems. For over a century, Flowserve jet pumps, combination cutting tools, rotary joints, control valves and automated controls have helped refiners realize significant improvements in the safety, performance and reliability of their decoking operations.

With the acquisition of Lawrence Pumps in 2011, Flowserve rounded out its decoking portfolio with the VPL3600 vertical maze pump. The addition of this model enables Flowserve to offer a complete roster of heavy-duty pumps for virtually every application in the delayed coking unit.

For more information on the complete line of pumps and solutions for the delayed coker unit, refer to Flowserve.com.



Features and benefits

High chrome iron, thick-walled, wet end construction per ASTM A532, Class III Type A

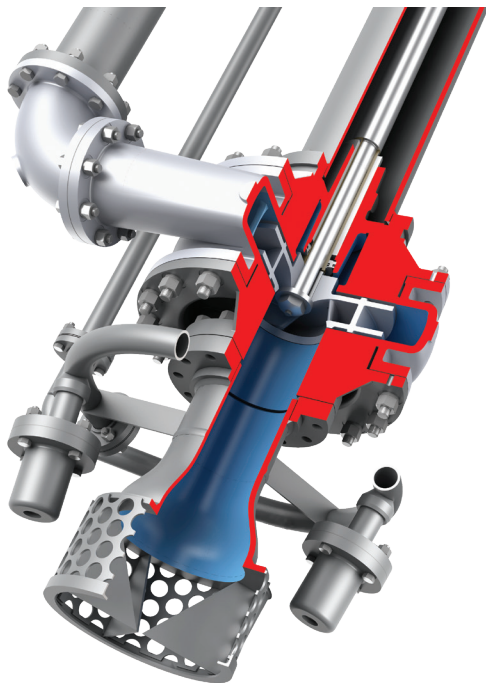
Provides abrasion and wear resistance well beyond that of typical ISO/API pumps. Optional materials include ISO 13709/API 610 and NACE MRO175 compliant alloys. Hard facing of critical areas is available.

Slurry hydraulics for maximum performance and longevity

Slurry impeller with front and back shroud repelling vanes minimizes suction recirculation and eddy currents and eliminates impeller wear rings. Casing and impeller design prevents abrupt changes in the flow path to minimize abrasion of critical areas.

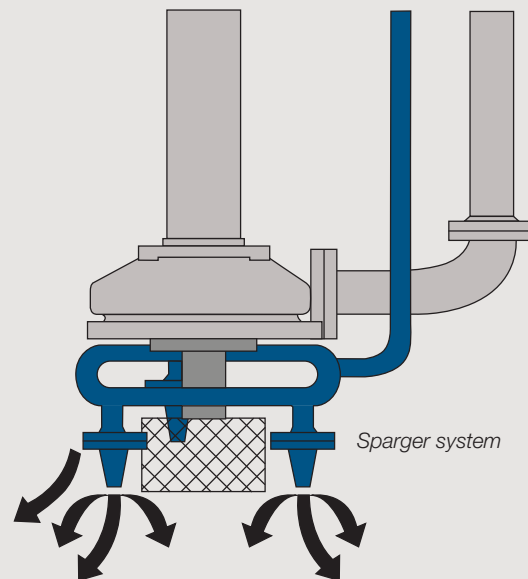
Water-filled support column for long-term durability and performance

Fitted with a tight tolerance restriction bushing, the column is filled with clear flush water to establish positive pressure behind the impeller. This minimizes the ingress of solids, providing a clean environment for the shaft and sleeve bearings.



Hydraulic sparger system for clog-free pump operation

Prevents “silting-in” by keeping suspended coke fines from settling and solidifying around the pump suction. A ring of nozzles around the suction strainer agitates the slurry using water from an outside source or with the assistance of an optional duplex filtration system.



Fluted FRP/nitrile rubber sleeve lineshaft bearings for extended bearing life

Dampen destructive vibration, even when subjected to frequent cycling.

Back-to-back angular contact thrust bearings with proven reliability

Designed to handle combined axial and radial loads with off-the-shelf sourcing for quick, economical maintenance. Grease and oil-flood lubrication available.

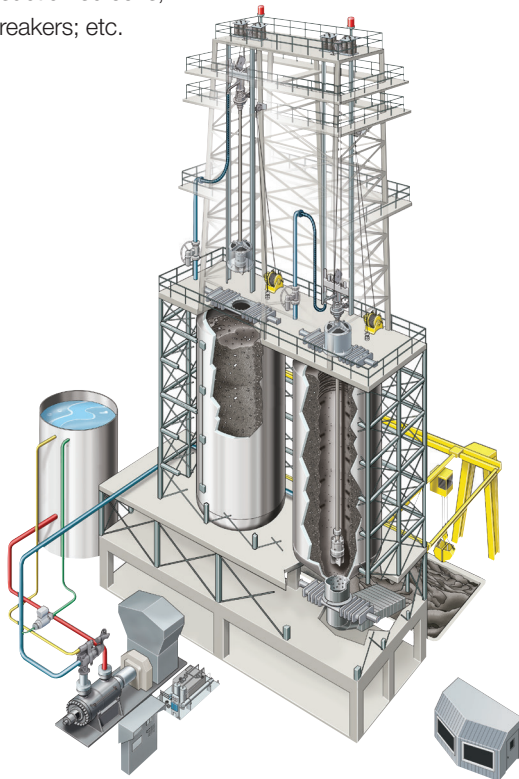
Custom shaft lengths to match pit requirements

Lengths to 6 m (20 ft) with a single shaft. Greater lengths available with a two-piece configuration.



Options

- Choice of shaft sealing system
- Inducers for low-NPSHA services
- Low-flow, high-head design
- Mechanical agitators; steam jackets; custom suction screens; vortex breakers; etc.



Service-backed reliability

Flowserve is committed to helping refiners improve decoking system reliability. Engineering durable products such as the Lawrence Pumps VPL3600 maze pump is just one way we do that. Another is through our extensive service capabilities. We have the engineering and technical expertise to evaluate service conditions and configure the optimum hydraulic and mechanical pumping solution to deliver the pump's expected five-year MTBR performance interval.

System-wide support

Moreover, Flowserve customer service technicians are on call 24 hours a day, seven days a week to respond to scheduled or unscheduled outages as well as construction, installation and startup service needs. Technicians are specifically trained to evaluate and troubleshoot problems with decoking systems and equipment. Backed by Flowserve design and engineering groups, technicians have access to manufacturing drawings, bills of material and performance data so they can help refiners develop practical and reliable solutions to decoking problems.

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