



Blackmer



PSG
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Where Innovation Flows

Diesel Fuel Oil

APPLICATION DOCUMENT

The romanticized version of powering a locomotive – a dust-covered engineer shovels coal into a red-hot furnace – is long gone, replaced by train engines that rely on diesel fuel oil for their locomotion, with the first diesel-powered locomotives appearing in the United States as far back as 1925. The number of diesel-powered locomotives in use in the United States continues to grow, with more than 25,000 active locomotive units riding the rails in the U.S. every year since 2013, up significantly from the less than 19,000 that were active as recently as 1995.

All rail yards are equipped with diesel-fueling systems that allow the locomotives and their 2,200-gallon fuel tanks to be refilled before departing with their next shipment. Diesel fuel oil is of a low viscosity, typically between 1 and 20 centipoise (cP) with zero vapor pressure. Therefore, the main challenge in identifying a pump technology for diesel-locomotive fueling is finding one that can maintain volumetric consistency when handling relatively thin liquids.

Positive displacement (PD) sliding vane pumps are a top choice because their unique self-adjusting vane design enables them to reliably handle thin liquids. Additionally, the self-adjusting vanes allow them to maintain near-original performance during the life of the pump, which means that the pump's mean time between maintenance (MTBM) can be as much as two to three years. Sliding vane pumps are also dry-run capable, meaning the lines don't need to be wetted in order to pull a vacuum and start pumping.



GNX

For locomotive fueling, Blackmer offers its GNX Series Sliding Vane Pump. The GNX model – which is part of the Blackmer Iron Line of PD sliding vane pumps – is the industry's only alignment-free, reduced-speed PD pump. The GNX pumps incorporate a commercial-grade, single-stage gearbox. This gearbox is positioned between the pump and motor and held in place by a permanent dowelled connection that creates a structural link between the high-speed and low-speed sides of the pumping system. The result is a pump that will not need to be realigned either at installation or after a maintenance procedure. GNX pumps are available in 2-, 2.5-, 3- and 4-inch sizes with flow rates from 7 to 500 gpm (26 to 1,893 L/min) and 90-degree porting orientation (180 degrees for the GNXH model). A composite baseplate provides unmatched surface flatness, which reduces installation costs and operational vibration.

A second choice for diesel fuel oil applications is the X Series Sliding Pumps. The X Series pumps, which are also members of the Iron Line, are available in 2-, 2.5-, 3- and 4-inch flanged sizes with flow rates from 10 to 528 gpm (26 to 1,999 L/min). They are cast-iron construction (except the ductile-iron X4 model) with external ball bearings that are isolated from the pumpage by mechanical seals.



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BLACKMER SOLUTIONS

- [GNX Series Sliding Vane Pumps](#)
- [X Series Sliding Vane Pumps](#)

COMPETITION

- **Gear Pumps**

Gear pumps struggle to pump thin liquids, which can result in premature wear and excessive repair/ replacement costs.

- **Centrifugal Pumps**

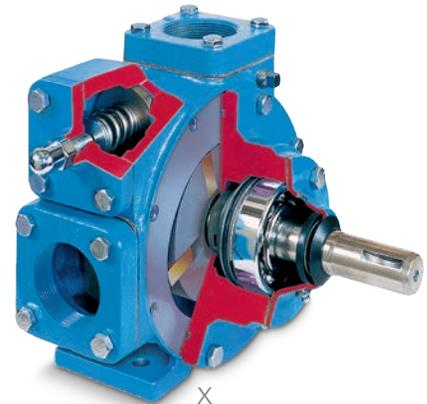
The lines of centrifugal pumps have to stay wetted, which makes them incapable of dry-run operation. They also need to be self-lubricated, which creates cross-contamination concerns if different types of fuels are handled at the same fueling location.

- **Lobe Pumps**

Similar to gear pumps, these pumps have difficulty with thin liquids, leading to premature wear and repair or part-replacement costs.



GNX



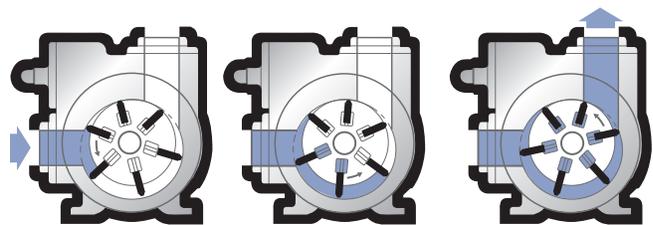
X

GLOSSARY

Mean Time Between Maintenance (MTBM) - the average length of operating time between one maintenance action and another maintenance action for an industrial system or component.

Centipoise (cP) - a unit of dynamic viscosity defined as the amount of force needed to move a layer of liquid in relation to another liquid; considered the standard unit of measurement for liquids of all types.

HOW BLACKMER SLIDING VANE ACTION WORKS



For more information on these additional solutions, visit us at blackmer.com.



PSG

1809 Century Avenue SW
Grand Rapids, MI 49503-1530 USA

P: +1 (616) 241-1611 • F: +1 (616) 241-3752

info@blackmer.com

blackmer.com

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