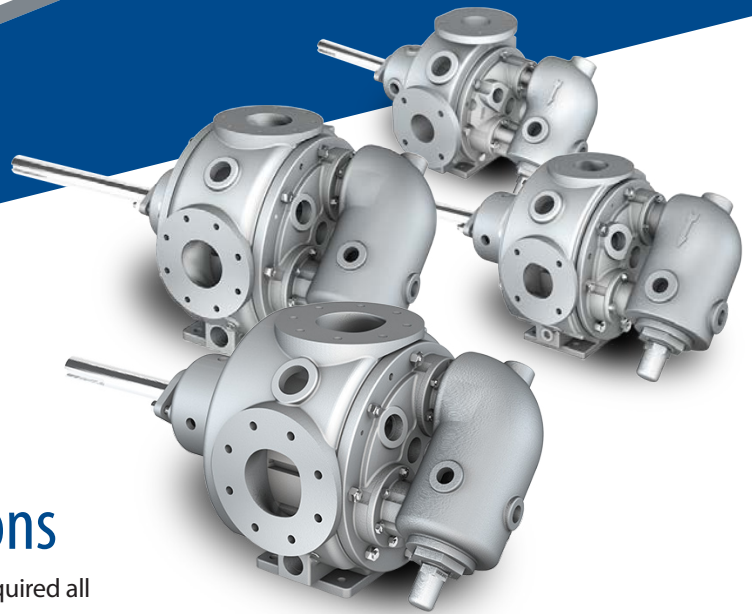


Internal Gear Pumps for Asphalt and Bitumen





EnviroGear® V Series Pumps for Asphalt and Bitumen Applications

Specialty pumps designed for the rigors of pumping asphalt are required all along asphalt's production and supply chains. They can be found at refineries where raw asphaltic products are produced, terminals where various asphaltic products are stored, hot-mix plants where paving products are produced and roofing material manufacturing plants where shingles and other roofing materials are manufactured. Asphalt pumps are at the heart of these and other systems that rely on asphaltic products as their base for production.

Because of the very nature of asphalt, it is extremely difficult to pump. But luckily for those involved, EnviroGear® V Series Internal Gear Pumps incorporate unique design enhancements that meet the challenges associated with pumping asphalt and offer a reliable solution to meet and exceed the operational demands of any facility.

Challenges of Asphalt and Bitumen Applications

The main challenge in asphalt and bitumen operations is the most obvious one: as asphalt changes temperature, it can range from a solid to a liquid with a wide variety of fluid characteristics depending on the chemical makeup. This makes it extremely difficult to pump with standard pumping technology.

Thermal Control

Pumps designed for asphalt applications must be able to maintain specific thermal conditions. There are low velocity areas in the pump - such as behind the rotor - that are prone to cold spots. Having multiple jacketed zones in and around the pump provides superior heat distribution and is a critical performance advantage for EnviroGear.

Pump Internals

Due to the wide range of temperatures and viscosities of asphalt products, special consideration must be taken when selecting the proper internal clearances. Oversight can lead to bushing, gear or shaft failure. Furthermore, internal components can be placed under significant stress when pumping asphaltic products. Viscosity changes due to temperature variations can cause the asphalt product to solidify in the pump or piping system, leading to potential rotor gear-tooth failure and other significant

issues. High strength ductile iron internal components, standard to EnviroGear, provide the strength and durability over more expensive steel optioned pumps. Options such as hardened cast iron and tungsten carbide bushings provide the durability needed to address wear from fillers in asphalt.

Sealing

Shaft sealing is by far one of the most significant challenges to overcome in an asphalt application. Currently packing is the most widely used shaft sealing solution in all asphalt applications due to its reliability, simplicity, and ability to operate in all viscosity and temperature ranges. However, packing must leak in order to operate reliably for long periods of time. In clean asphalt applications where there are minimal solids and leakage is not acceptable, cartridge triple-lip seals or mechanical seals can be used. With a wide range of asphalt products in the market, all with different fluid characteristics, special considerations need to be taken from application to application.

EnviroGear V Series Asphalt Pump Solution

The latest innovation from EnviroGear is the true advancement in the handling of asphaltic products: the V Series Internal Gear Pump. An exciting development for the industry, V Series pumps address and overcome the hurdles in pumping asphalt, and do it in a way that is safe, reliable and economical, while also being a direct drop-in replacement for competitive models.

Unlike competitive pumps that are just “good enough” to get the job done, EnviroGear V Series pumps feature targeted design enhancements that make them ideal for the challenges inherent in the handling and transfer of asphalt and bitumen products. These design enhancements include:

- Up to 35% more jacket surface area than the competition, which improves system reliability by incorporating the following features:
 - The unique ability to utilize the jacketed head and pressure relief valve (PRV) simultaneously
 - Jacketing located behind the pump rotor, which removes a known cold spot that can result in hard startups and premature pump and seal failures
 - The industry’s largest jacketed surface area on the pump case and PRV that enables uniform heating whether using steam or hot oil
 - Superior pump jacketing provides faster time to temperature of the product being pumped, getting back to production sooner

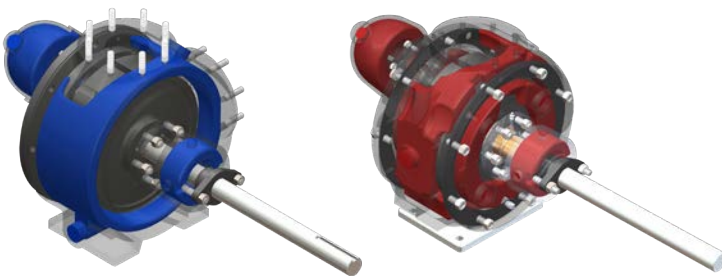
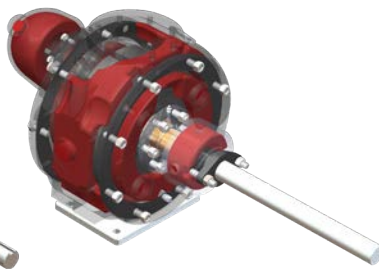


Image above represents typical jacket surface area of competitor pumps



V Series Jacketed Surface Area

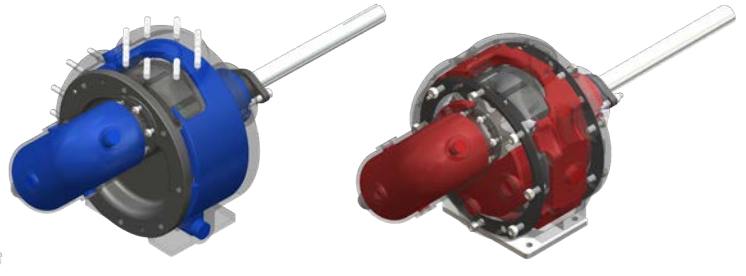
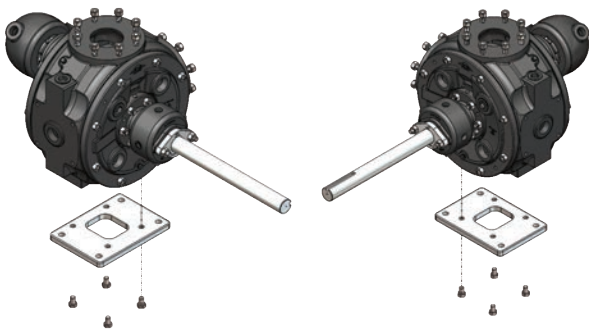


Image above represents typical jacket surface area of competitor pumps

V Series Jacketed Surface Area

- Rotatable casing that enables both right-hand and left-hand flange orientations without additional costs or lead times



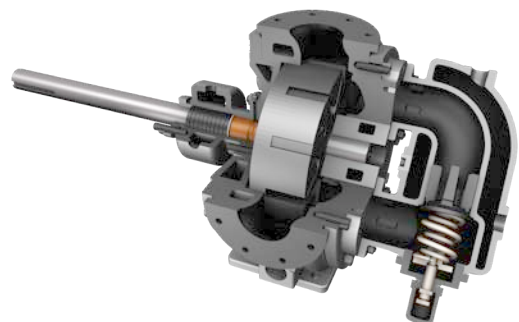
- Standard high-strength, ductile-iron gear material that improves reliability when compared to steel rotors, all while resulting in upwards of 25% in purchase-cost savings

High strength ductile iron is EnviroGear’s standard offering with other hardened material component options available to provide improved pump life:

- Surface hardened case, head, rotor, idler and shaft
- Special high-temperature hardened steel idler pin
- Hardened cast iron idler bushing, RBS radial bushing, and stationary thrust washer



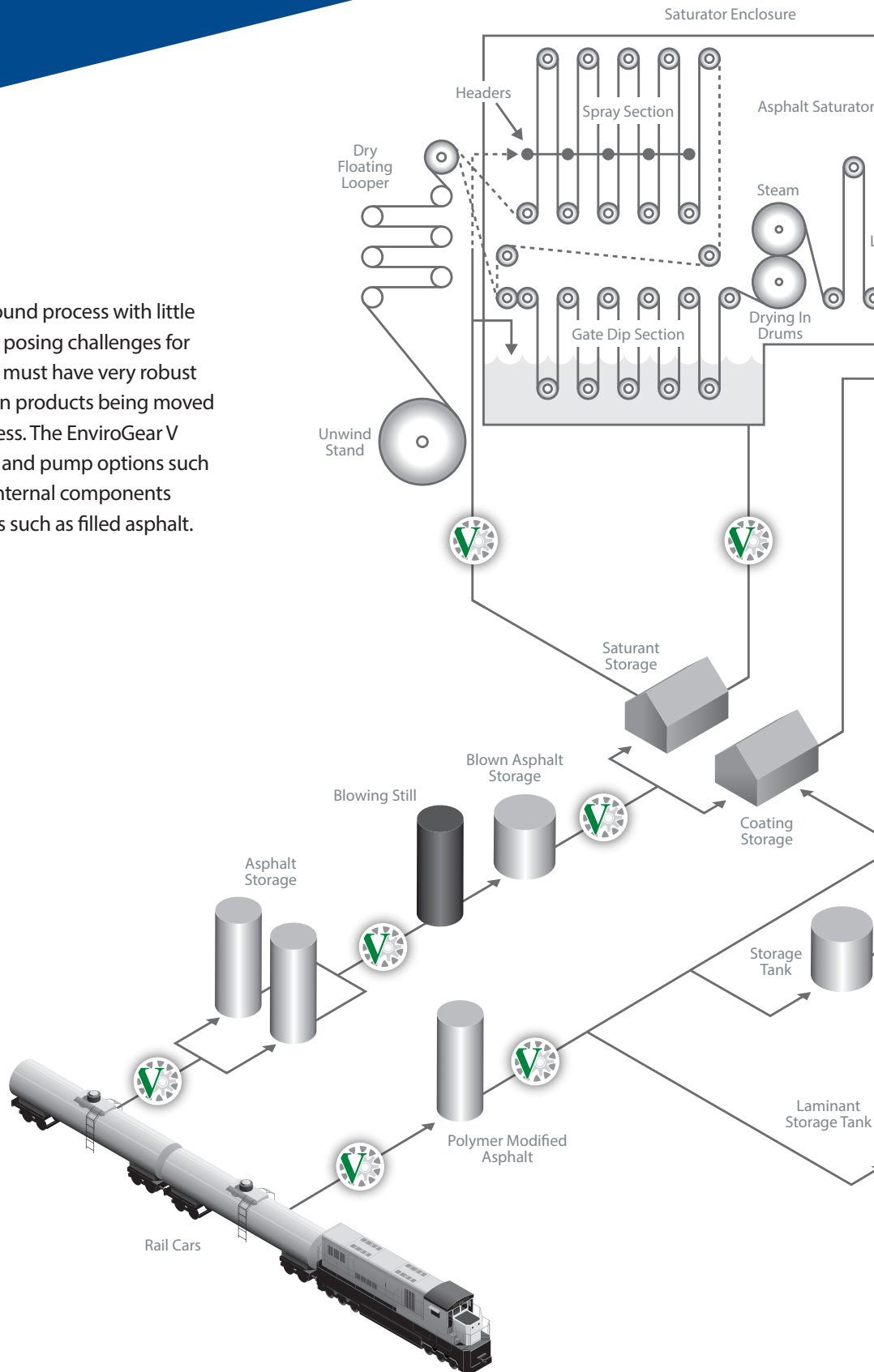
- World’s first drop-in replacement for the Viking® 34 Series

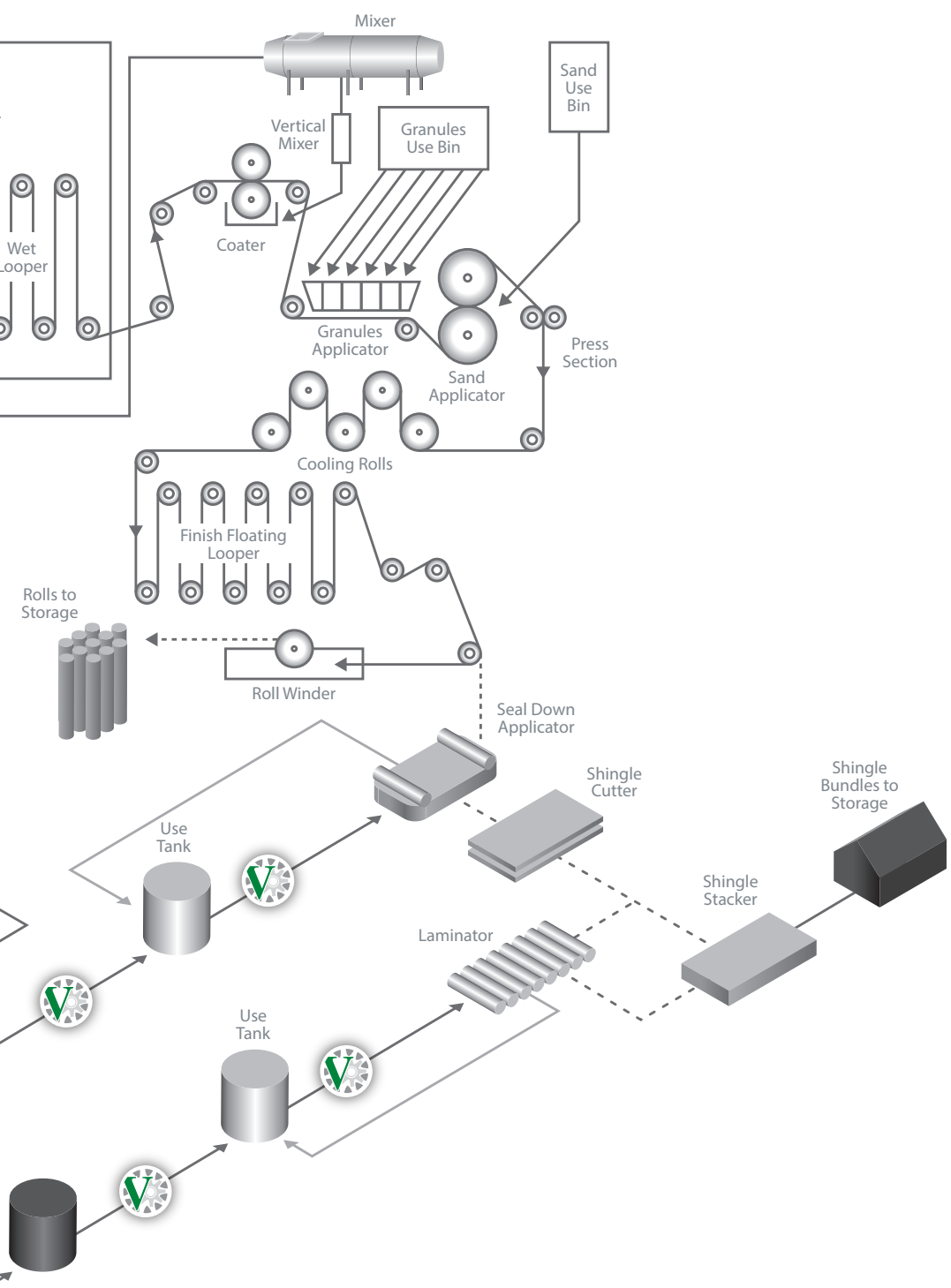




Roofing Application

Roofing material production is a year-round process with little to no down-time for maintenance, thus posing challenges for the equipment and pumps. The pumps must have very robust designs to handle the variety of bitumen products being moved to various spots in the production process. The EnviroGear V Series incorporates hardened bushings and pump options such as standard high strength ductile iron internal components which provide longer life in applications such as filled asphalt.







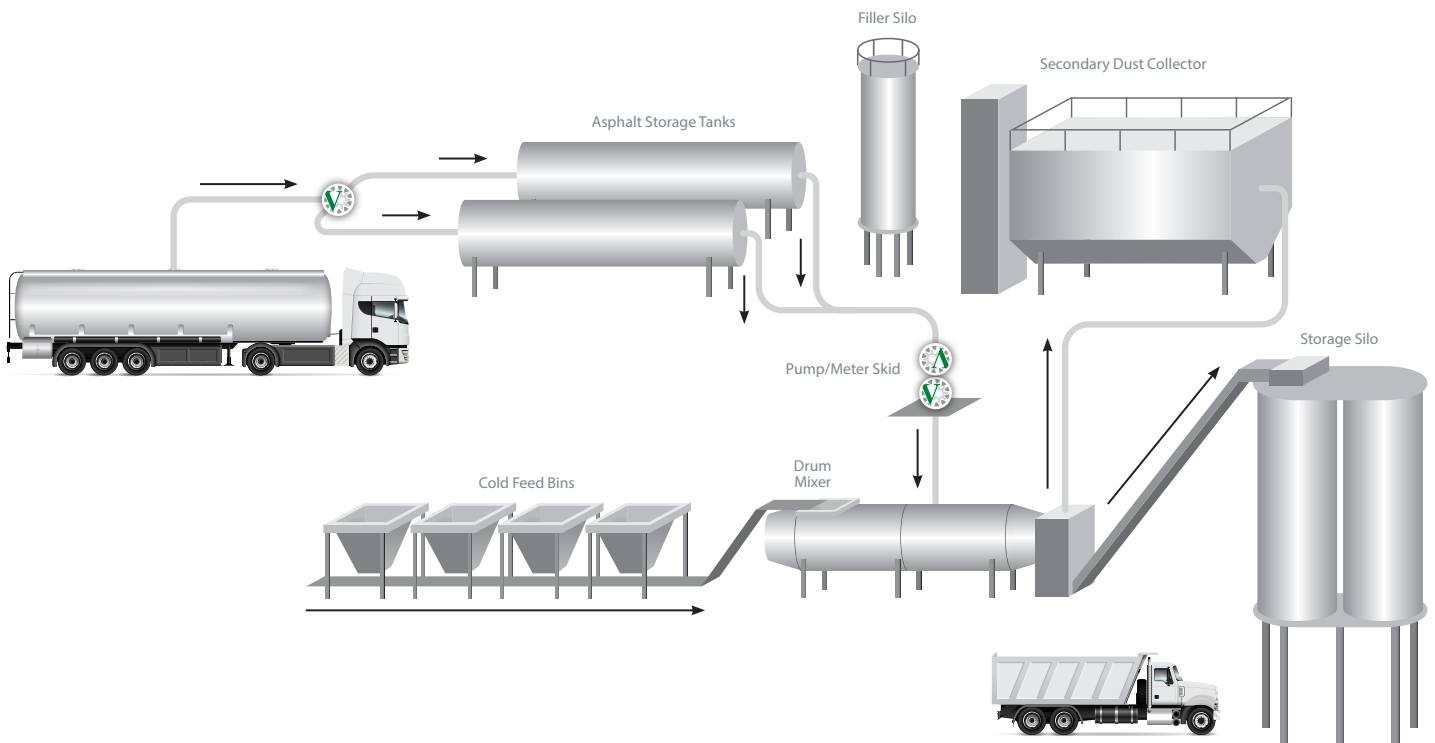
Hot-Mix Application

V Series Internal Gear pumps are the first-choice pumping technology in hot-mix asphalt (HMA) manufacturing. HMA paving materials consist of a blend of high-quality aggregates of various sizes and liquid asphalt cement. The materials are heated and mixed in order to produce HMA, which can be manufactured at any of four (4) different types of mix plants – batch, continuous, parallel-flow drum and counterflow drum.

The main challenge in the manufacture of HMA is the temperature variances that can alter its viscosity, which have the capability to rapidly change it from a liquid to a solid. These viscosity changes make it extremely difficult for standard pump technologies to pump HMA. The V Series pumps overcome these challenges and feature:

- Industry-leading jacket surface area
- High-strength ductile iron gear materials
- Wide range of internal component material options
- Flexible sealing configurations

EnviroGear V Series pumps are ideal for hot-mix production including bulk transfer and metering applications.

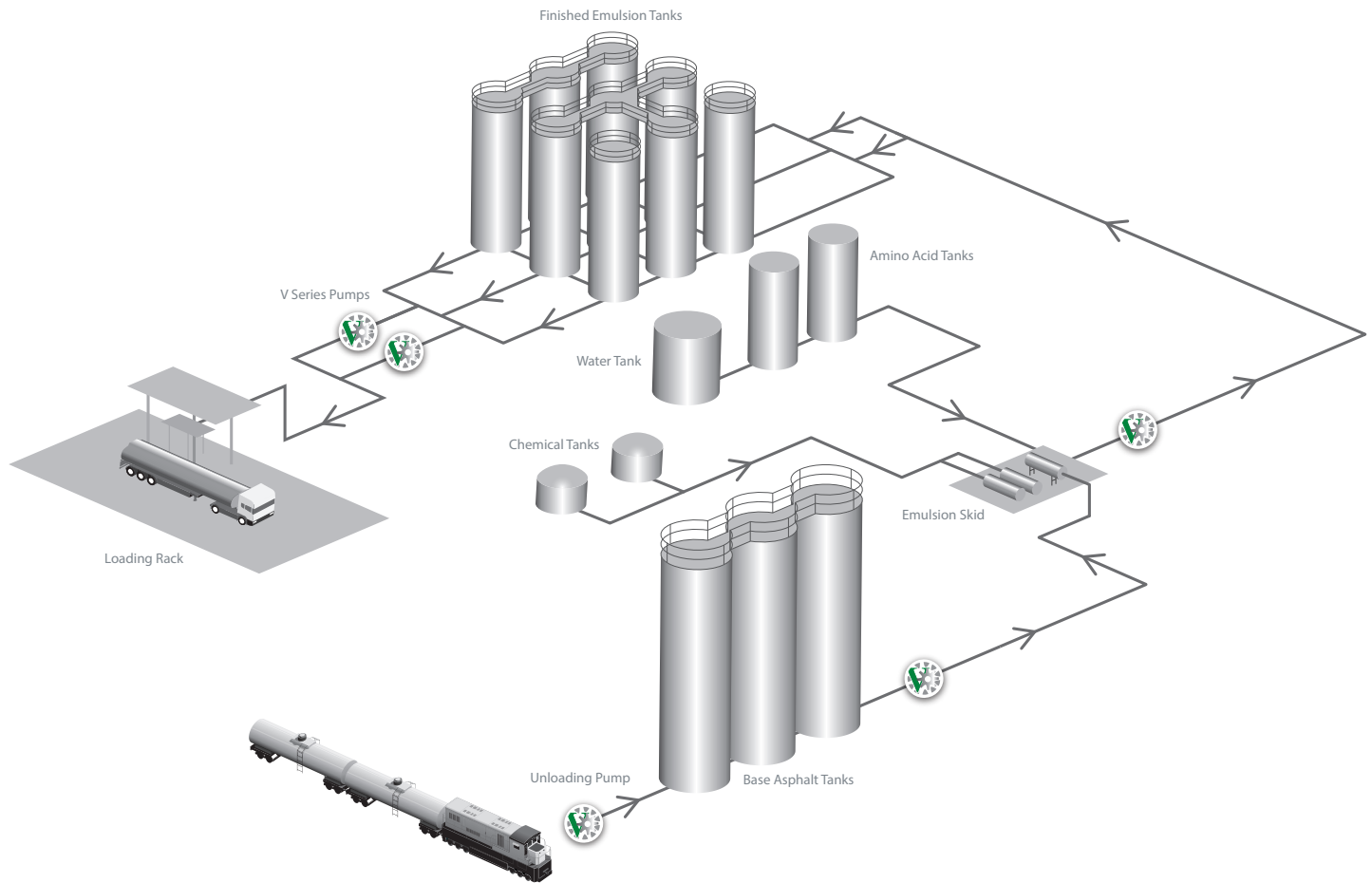




Emulsion Application

Throughout the asphalt emulsion process, internal gear technology is used in its production. Standard EnviroGear G Series technology is used for the transfer of polymers and chemicals used in the emulsifying process.

The EnviroGear V Series pump with standard high strength ductile iron components, increased jacketed surface area and internal component options (including hardened bushings) are well suited for un-loading/loading, transfer and metering of asphalt emulsions.





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