

Triton® White Paper

Handling Flammables with Triton Vacuum Systems

Triton's vacuum systems are designed to handle flammable and hydrocarbon products.

In the industrial vacuum industry, three types of vacuum pumps are used: rotary lobe blowers, sliding vane (aka rotary vane) pumps, and liquid ring pumps. A short discussion will show why the use of Triton vacuum systems provides an inherently safe alternative for flammable products.



Rotary lobe blowers use two or three figure-eight metal lobes which spin at very high rates of speed and at very close tolerances. As the vacuum increases, the lobes begin to heat up. Any single particle with the possibility of sparking that enters the pump can turn the blower into a flame thrower. There have been several incidents in the industry from this cause.

Additionally, the product vapor is discharged through an exhaust muffler at 5,000 – 6,000 cubic feet per minute. Temperatures are so high that auto-ignition from the exhaust is possible. Due to these drawbacks, many chemical plants and refineries are banning the use of blowers in this application.

The rotary sliding vane pump is safer. It spins slower, and uses non-sparking fiber vanes that are coated with oil, which minimize the risk of a spark hazard inside the pump. Typical rotary vane pumps have an airflow of only 400-500 cubic feet per minute, which is much less than the rotary lobe blowers. Additionally, as the vacuum increases, the discharge air is reduced and further slows the exit of product vapor to the atmosphere. Rotary vane pumps are used in the Triton 500 system, which is the reason this system can be used safely for flammables and hydrocarbons.

For added security, we recommend the use of the liquid ring pump. A single impeller spins at slow speeds inside a metal housing. The service liquid (most commonly, water) spins and creates a virtual housing. Thus, there are wide clearances between the rotor and the metal housing. This creates the most forgiving environment for any potential spark-producing particle that gets pulled into the pump.

Air and vapor from the pump are then discharged to an exhaust tower. The pump service liquid (water) supply absorbs some of the vapor, resulting in a reduced concentration of vapor to the atmosphere. For these reasons, the liquid ring pump used in the Triton 1500, Triton 2000, and Triton 2500 systems, provides the surest method for handling flammables and hydrocarbons.