

Innovative New Paradigm for the Rotary Lobe Pump

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With a history of engineering innovation, NETZSCH rethought the current state of rotary lobe pump design and pushed it into a new paradigm that challenged conventional wisdom. In designing the TORNADO® T2 rotary lobe pump, customer “pain points”, relating to reliability, maintenance, performance and total cost of ownership informed the thinking of NETZSCH engineers.

Traditional rotary lobe pumps employ rubber-covered lobes that rotate inside a metal housing, often with bolted-in metal wear liners. In fact, NETZSCH used this approach in its original TORNADO® (T1) Rotary Lobe Pump. This was the first convention that the NETZSCH design team tackled. They asked, “Why not reverse the construction of a rotary lobe pump by making the lobes in steel and the housing in rubber?” The result of this contradictory thinking is at the center of the new TORNADO® T2, with lobes running inside a housing with an elastomer liner. The concept of combining the wear resistance and simple metal-rotor/rubber-stator construction of a progressing cavity pump with traditional rotary lobe pump

technology establishes a remarkable engineering development for the TORNADO® T2. This design breakthrough does not require O-rings or gaskets and creates the advantage of durable and robust construction along with simplicity and ease of maintenance.

For more than fifty years it was common knowledge that a rotary lobe pump could not be built without a set of timing gears. The TORNADO® T2 pump pushes this concept into the past by employing a single, synchronous toothed timing belt. By using technology common to the automotive industry, the maintenance-intensive and costly gearbox has been eliminated.

Next on the list for NETZSCH engineers was a solution for minimizing the problem of pulsation while still using durable and simple bi-lobe rotors that are better for solids handling. A unique pulsation reduction system employs channels molded into the rubber walls of the liner that release the lobe energy and dampen pulsation. This is the equivalent of using a multi-lobe rotor, meeting customer demands for shear sensitive product conveyance and no pulsation downstream.

The design of the pump housing includes integrally cast round flanges. Having full flange-to-flange access when servicing the pump offers maintenance personnel more room to access pump internals without the need to disassemble piping. A unique seal design greatly reduces the chance of leaks and catastrophic pump failure.

Full “service-in-place” was engineered into the TORNADO® T2, thereby supplying easy access to the mechanical seals, rotors, liners, as well as for timing the lobes. Our engineers designed a tool that we include with the TORNADO® T2 that will radially and axially align the lobes to set the timing of the pump in less time than it takes to look for the tools to work on conventional lobe pump with timing gearbox.

The single timing belt drive, which eliminates the need for a second reduction component to the pump assembly, also reduces maintenance issues. There is no oil to replace or maintain and there are no timing gears to fail, significantly lessening the need for pump replacement. With a history of engineering innovation, NETZSCH rethought the current state of rotary lobe pump

design and pushed it into a new paradigm that challenged conventional wisdom. In designing the TORNADO® T2 rotary lobe pump, customer “pain points”, relating to reliability, maintenance, performance and total cost of ownership informed the thinking of NETZSCH engineers.

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