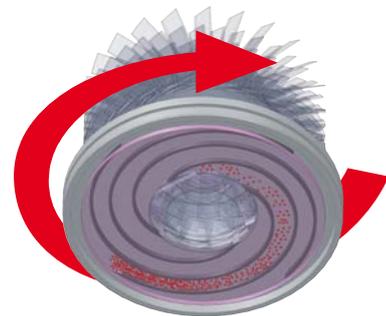
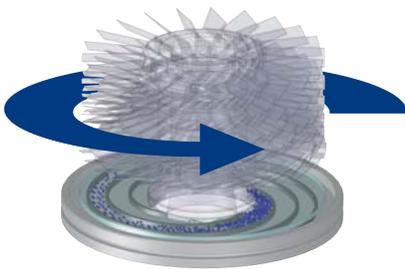


ACHIEVE HIGHEST VACUUM PERFORMANCE



Agilent TwisTorr 304 FS

The Agilent TwisTorr 304 FS is a compact, reliable, energy efficient 300 l/s Turbo drag pump, with innovative technologies leading to outstanding vacuum performance and reliability, designed to meet the highest quality standard. TwisTorr 304 FS combines TwisTorr molecular drag technology and Agilent Floating Suspension.



Our innovative TwisTorr molecular drag stages, composed of an array of pumping channels with a patented spiral design, greatly increase the pumping efficiency in a very compact space. This technology represents a major milestone in the evolution of hybrid turbo molecular-drag high vacuum pumps, providing significant improvements in light gas pumping speed and compression ratio.

Our innovative new suspension (patent pending) is designed to meet the highest reliability standard in the industry by guaranteeing long term vibration stability, reducing acoustical noise and increasing bearing life.

Molecular drag pumps are composed of a smooth rotor cooperating with channels machined on a stator; momentum is transferred from the rotor to the gas by way of "drag" or friction.

In the TwisTorr drag section the pumping effect is created by a spinning rotor disk which transfers momentum to the gas molecules. Molecules are forced to follow the specific spiral groove design on the stator. This design ensures a constant local pumping speed inside the channel and avoids reverse pressure gradients, minimizing power consumption in the pump.



The double-sided spiral groove design of the TwisTorr stators combines centripetal and centrifugal pumping action in series, reducing considerably the size of the drag section and optimizing performance.

TwisTorr are static parts, similar to MacroTorr stages. Each stator is positioned between smooth disks on traditional rotors with proven cantilevered design. Each stator has machined spirals on both sides. In the picture, gas flow path is represented by blue and red spherical particles, while the arrows represent the rotation direction. The double sided spiral groove design on the TwisTorr stator combines centripetal and centrifugal pumping action in series, reducing considerably the total dimension of the drag section and optimizing performance.

TwisTorr stages are optimized to deliver:

- High pumping speed and compression ratios for Hydrogen and Helium
- High throughput and high foreline tolerance for heavy gases with optimized power consumption.

Agilent Floating Suspension (FS) is the new generation of rotor suspension recently patented by Agilent Vacuum Products Division. FS consists of a couple of components, one for each bearing, each of them made up of two metal rings with silicone rubber vulcanized in between. The outer ring is flanged to the pump body, while the inner ring is press-fit to the bearing's outer ring. It is designed to guarantee bearing alignment due to geometrical precision of the ground rings mounted on the same piece of aluminum (the pump body). The radial stiffness achieved optimizes dynamic rotor behavior and critical speed positioning, and minimizes acoustic noise. The lower AFS assembly is aligned as an axial spring to provide constant preload to the bearing, and secure axial rotor positioning. In addition preload and vibration stability over time are guaranteed. AFS therefore offers two advantages over other approaches:

1. Both radial stiffness of the suspension and bearing axial preload are stable over time.
2. The simplest mounting scheme requires only two components to provide radial support, axial support and bearing preload, instead of the four-to five components required by the previous solution.





Agilent Floating Suspension can ensure:

- Low vibration and acoustical noise
- Optimal working conditions for the bearings, extended operating life
- Exceptional stability for the very demanding SEM application

