

Ensuring Continuous Operation of Turbomolecular Pumps with PFPE Vacuum Pump Oils



Chengdu, Sichuan Aug 31, 2026 ([Issuewire.com](https://www.issuewire.com)) - Modern high-vacuum systems require exceptional fluid stability to maintain deep vacuum pressures, a critical technical requirement effectively met by Sichuan Kingrande New Materials Co., Ltd. through its specialized Flucon fluid technology. Functioning as a premier manufacturer, the company supplies highly stable [PFPE Vacuum Pump Oils](#) specifically engineered to support the continuous, high-speed operation of advanced turbomolecular and rotary vane pumps. Manufactured in a dedicated Suining facility with a workforce of over **300 employees** and certified to **IATF16949:2016** and **ISO9001:2015** standards, this robust operational foundation ensures that semiconductor fabs, chemical laboratories, and industrial vacuum operators receive ultra-pure, chemically inert fluids capable of protecting expensive pump bearings while minimizing costly, unplanned maintenance downtime.

High-Speed Rotors Demand Extremely Low Vapor Pressure Fluids

Turbomolecular pumps generate ultra-high vacuum environments by spinning finely angled rotor blades at extraordinary speeds, often exceeding 50,000 RPM. At these rotational velocities and extreme low pressures, the primary threat to the vacuum environment is the backstreaming of the pump's own lubricating fluid. If the oil volatilizes, vaporized molecules will aggressively migrate back into the clean

chamber, severely contaminating the process.

[FSE](#) addresses this fundamental challenge by engineering its Flucon PFPE oils to exhibit exceptionally low vapor pressures. The fully fluorinated molecular structure ensures that the fluid remains securely in its liquid state, even when subjected to the extreme low pressures required in semiconductor deposition, mass spectrometry, and electron microscopy.

By specifying these advanced PFPE fluids, vacuum system engineers effectively eliminate the risk of hydrocarbon backstreaming. This guarantees that the turbomolecular pump provides pristine, uncontaminated vacuum generation, allowing highly sensitive analytical instruments and critical manufacturing processes to operate accurately without interference from migrating oil molecules.

Oxidative Stability Prevents Oil Degradation in Harsh Environments

Beyond maintaining low vapor pressure, vacuum pump oils must constantly survive exposure to the harsh, reactive gases being evacuated from the process chamber. When pumping aggressive media such as oxygen, halogens, or reactive chemical vapors, conventional hydrocarbon oils rapidly oxidize, polymerize, and break down into highly acidic, sludge-like byproducts.

The Flucon PFPE series completely resolves this vulnerability through absolute chemical inertness. Because the perfluoropolyether backbone contains only strong carbon-fluorine and carbon-oxygen bonds, it cannot react with incoming oxygen or aggressive chemicals. It is fundamentally non-flammable and will not ignite or explode, even when pumping 100% pure oxygen.

This unparalleled oxidative stability ensures that the fluid retains its designed viscosity and lubricating properties regardless of the gases passing through the pump. For operators managing aggressive chemical vapor deposition (CVD) or plasma etching processes, this inertness prevents the rapid oil degradation that destroys pump bearings and necessitates constant, expensive fluid changes.

Extended Fluid Lifespan Directly Lowers Maintenance Frequency

The rapid degradation of conventional pump oils forces maintenance teams into a cycle of frequent, disruptive fluid replacements. Every oil change requires taking the vacuum system offline, venting the chamber, draining the hazardous degraded fluid, and spending hours pumping the system back down to its required base pressure.

By transitioning to highly stable PFPE vacuum pump oils, facility managers drastically extend the operational lifespan of the lubricating fluid. Because PFPE does not break down or form sludge, it continues to protect the pump's high-speed bearings for exponentially longer periods compared to hydrocarbon alternatives. The oil can often be regenerated and reused, further extending its lifecycle.

This massive extension in fluid lifespan directly translates to minimized maintenance frequency. Reducing the number of required oil changes drastically increases the overall equipment effectiveness (OEE) of the entire vacuum system, saving massive amounts of labor time and preventing the severe financial losses associated with halting continuous manufacturing processes.

Manufacturer Capacity Guarantees Steady Global Supply

High-volume semiconductor fabs and large-scale industrial vacuum operations consume significant quantities of specialized pump fluids. These operators cannot tolerate supply chain disruptions or batch-

to-batch variations in fluid viscosity, as inconsistent lubrication immediately threatens the survival of highly expensive turbomolecular pumps.

Since its founding in **2004**, the enterprise has established a highly reliable, scaled manufacturing infrastructure. The dedicated Suining production facility, supported by over **300 technical and operational professionals**, provides the substantial capacity required to fulfill large-scale global demands without compromising the ultra-high purity standards required for vacuum applications.

This commitment to reliable, high-quality manufacturing is formally validated by comprehensive SGS audits, securing **IATF16949:2016**, **ISO9001:2015**, and **ISO14001:2015** certifications. For global procurement teams, these stringent accreditations provide documented assurance that every delivery of PFPE fluid will meet exact rheological and purity specifications, ensuring the stable, uninterrupted operation of their critical vacuum fleets.

Direct Technical Engagement Verifies Fluid Compatibility

Selecting the correct vacuum pump oil requires precisely matching the fluid's kinematic viscosity and vapor pressure curve to the specific operating temperature and rotational speed of the pump hardware. An incorrect viscosity specification can lead to inadequate bearing lubrication or excessive fluid friction, resulting in premature pump failure.

The technical support infrastructure enables proactive collaboration between the fluid manufacturer and the vacuum system engineers. By analyzing the exact pump model, operating pressures, and process gas chemistry, the technical team ensures that the selected Flucon PFPE grade provides optimal hydrodynamic lubrication and maximum vacuum performance.

Aligned with the corporate vision of "Fluorine & Silicone, for a Better Life," the organization actively supports vacuum professionals with verified technical data and reliable global supply. Engineering teams and procurement managers seeking to upgrade their vacuum pump lubrication strategies can access specific Technical Data Sheets (TDS) and initiate direct technical consultations through <https://www.cgfse.com/>.



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