

# UNDERSTANDING PERMEABILITY IN PTFE

## A Critical Factor in Valve Performance

Permeability, though often overlooked, plays a crucial role in determining the performance and longevity of materials used in critical applications. One such material is Polytetrafluoroethylene (PTFE), widely recognized for its exceptional chemical resistance, low friction, and high thermal stability. However, understanding its permeability is vital, especially in applications involving diaphragm valves in sanitary systems.



### What is Permeability in PTFE?

Permeability in PTFE refers to the material's ability to allow gases or liquids to pass through it over time. This property, while relatively low in PTFE compared to other polymers, is significant in environments where even the smallest leakage can lead to contamination, product loss, or safety hazards. The permeability of PTFE is influenced by several factors, including temperature, pressure, and the type of fluid in contact with the material.

### The Impact of Permeability on Valve Performance

In industries such as pharmaceuticals, biotech processes, and chemical processing, valves are critical components that must operate flawlessly to ensure the purity and integrity of the fluids they control. PTFE diaphragms, commonly used in sanitary diaphragm valve systems, must maintain their impermeability to prevent cross-contamination and ensure consistent performance.

The permeability of PTFE diaphragms directly affects the reliability of valves in controlling sensitive fluids. Over time, gases or liquids may permeate through the PTFE material, leading to potential failures. This is particularly concerning in applications requiring stringent sanitary standards.



### Setting the Standard in PTFE Diaphragms

At ITT-Tecnik, we understand the critical importance of material selection in valve components. Our PTFE diaphragms are engineered with meticulous attention to permeability properties, ensuring that they meet the highest industry standards for performance and safety.

Leveraging decades of research, study, and expertise, ITT has developed PTFE diaphragms that exhibit remarkably low permeability, making them ideal for use in demanding environments. Our commitment to innovation and quality ensures that our PTFE diaphragms provide unparalleled resistance to permeation.

### Advancements in PTFE Technology

Through continuous research and development, ITT has optimized the moulding process and molecular structure of PTFE to minimize permeability while enhancing its overall durability and flexibility. This results in PTFE diaphragms that not only offer superior performance but also extend the operational life of valves in which they are installed.

Our state-of-the-art manufacturing processes ensure that each PTFE diaphragm is produced with precision, maintaining the consistency required for critical applications. Whether in pharmaceutical manufacturing, biotech processes, or chemical processing, ITT PTFE diaphragms are trusted to deliver reliable performance, ensuring the safety and integrity of fluid systems.