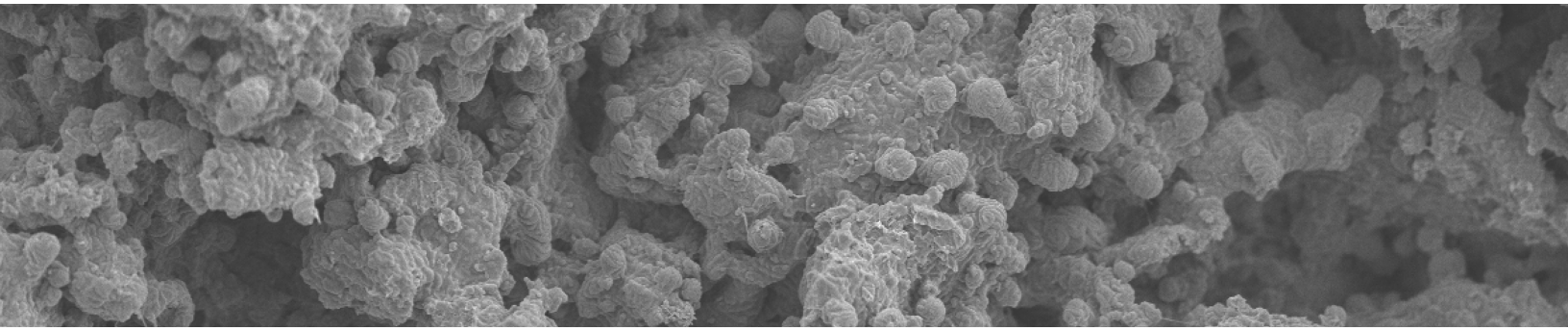
POREX® Virtek™

Fact Sheet: Sintered PTFE vs ePTFE



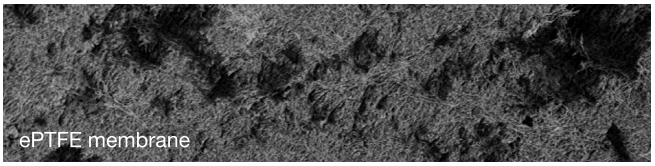
Discovered in the 1930's, PTFE is a well-known material that has excellent temperature, environmental and chemical resistance; and is used in many electrical, industrial, medical, and consumer applications. PTFE also has very low surface energy — making it very slippery and naturally hydrophobic. In the late 1960's, a process was developed to stretch PTFE film (known as expanded PTFE or ePTFE) to the point it becomes porous, thus allowing passage of small molecules such as air and water vapor yet still repelling polar liquids such as water. Expanded PTFE — often fabric supported as part of a layered composite — found applications in areas such as in rain-resistant breathable clothing and many industrial venting applications.

In the 1990's, POREX® developed a proprietary PTFE sintering process to manufacture an engineered, breathable microporous material that offered an alternative to expanded PTFE. The sintered PTFE manufacturing process results in an intricate network of open-celled, omni-directional pores that offer a different level of performance compared to ePTFE.

The POREX Virtek™ sintered PTFE process begins as fine particles with a tight size distribution. The particles then go through a forming and sintering process to create a bulk microporous structure. This process fuses the fine particles together while creating voids. The size of the voids can be predetermined by varying the morphology of the starting particles. The resulting structure is then cut to a precisely controlled thickness.

The process results in a robust, durable, design-flexible omni-directional material with long-term value advantages that does not require a supporting layer (scrim). It can be easily handled manually or by high-speed manufacturing equipment POREX Virtek™ PTFE can be applied using various techniques, such as adhesive backing, vibrational or heat welding, insert molding, press or compression fitting, or clamped into place.

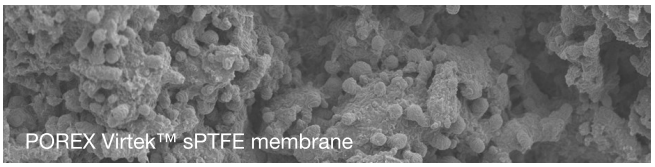
To better illustrate the differences between ePTFE and POREX Virtek™ sintered PTFE, below is a microscopic image of a typical unsupported ePTFE membrane. The membrane forms a network of interconnected nodes and fibrils which provides the structure for gases to pass. One of the limitations of this network is the tensile pull of the fibrils to the nodes which can change with temperature and pressure, thus the ePTFE membrane is often part of a multi-layered structure that supports and protects the fragile stretched structure.



ePTFE membrane

Below is a typical microscopic image of POREX Virtek™ sintered PTFE. Structure differences are apparent, as absent are the nodes and fibrils. Visible is a network of well-controlled particles all bonded to their neighbors.

This structure provides a very robust three-dimensional membrane that experiences very little change with temperature or pressure, and requires no supporting layers.



POREX Virtek™ sPTFE membrane

POREX® Virtek™ Sintered PTFE

WITH THE DIFFERING STRUCTURES COME DIFFERENT FEATURES AND BENEFITS

Features	POREX Virtek™ PTFE	Expanded PTFE with no support*	Expanded PTFE with support*
Naturally hydrophobic (IP-rated)	Yes	Yes	Yes
Sintered porous structure	Yes	No	No
High Temperature (>260 C)	Yes	Yes	No
High tensile strength in all directions	Yes	No	ID
Precise porosity and thickness control	Yes	ID	Yes
High UV and outdoor weather resistance (UL 746C)	Yes	Yes	No
Meets UL 94 flammability (V0)	Yes	Yes	No
Secondary oleophobic treatment meets AATCC grade 8	Yes	ID	U
Water naturally runs off surface	Yes	ID	ID
Benefits			
Low flex fatigue	Yes	No	Yes
Omni-directional (can be installed any direction)	Yes	ID	No
Heat welding	Yes	Yes	ID
Vibrational welding	Yes	No	No
Robust pore structure; safe to handle during assembly	Yes	No	ID
Can plate metallic or other secondary layers	Yes	ID	ID
Mounting inside or outside of enclosure	Yes	Yes	ID

* There are numerous suppliers, variations and quality levels within these classes of materials and exeptions will occur.

U – Unknown
ID – Insufficient Data or can vary over life of product

For more information about Porex Corporation, visit porex.com, or email us at electronics@porex.com.

POREX Filtration Group®

porex.com

Porex Corporation
500 Bohannon Road, Fairburn, GA 30213 USA
T. +1 770 964 1421 F. +1 770 969 0954
info.porex.amrs@filtrationgroup.com

Porex Technologies GmbH
Strangenhäuschen 30, 52070 Aachen, Germany
T. +49 241 910525-0 F. +49 241 910525-16
info.porex.emea@filtrationgroup.com

Porex Technologies Sdn Bhd
Lot PT 74, Jln Hulu Tinggi 26/6, Sek. 26,
Hicom Industrial Park, 40400 Shah Alam, Selangor, Malaysia
T. +603 5191 3308 F. +603 5192 3308
info.porex.apac@filtrationgroup.com

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