

## **S1.5.2 MODERN EPTFE MEMBRANE BASED HEPA/ULPA FILTERS FOR IMPROVED ENERGY SAVINGS AND RISK REDUCTION**

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Strict demands are put on HEPA and ULPA filters that are installed as terminal filters e.g. in cleanrooms, isolators or workbenches. They must continuously guarantee safe operation while predefined air quality requirements and energy efficiency are optimized. With the increased focus on environmental performance as well as process safety, last but not least stimulated by legislation, the contribution made by air filtration towards meeting sustainability and safety targets has become much more important. For that the filter media itself is of major importance.

Across all applications, with exception of microelectronics, standard filter media for HEPA and ULPA filters so far had been fiberglass paper. Being free of boron filter media based on expanded PTFE (ePTFE) is used in microelectronics since decades. Based on latest developments in ePTFE membrane technology such HEPA filters find more and more applications particularly in pharmaceutical industry.

This presentation describes how the latest generation of ePTFE membrane media contributes to low cost operation, sustainable environmental performance as well as process safety.

It sets out structure of modern ePTFE membrane media, how air filters with ePTFE membrane media provide significant reduction in energy consumption as well as risk reduction. Due to its nanometer topology these media allow slip-flow around the fibers which leads to break down of pressure drop up to 50% compared to traditional fiberglass paper.

In addition it presents the results of several studies on superior stability and durability of ePTFE membrane media over traditional fiberglass media. Based on several test regarding mechanical and chemical resistance it is demonstrated that ePTFE membrane media offers a significant improvement in reducing media failure risk for a retained filter integrity. By installing HEPA and ULPA filters with ePTFE membrane media, critical applications working under controlled conditions, are able to reduce cost as well as operational risk and improve quality.