



Why Membrane?

Exploring the Benefits of Surface Filtration

Membrane surface filtration has been used successfully in baghouses for a number of years. During that time, it has proven that it can be an economical choice for product collection and emission control.

Because of demonstrated economic advantages, surface filtration media has consistently increased its market share. These gains have caused the manufacturers and suppliers of fabric media to begin thinking surface filtration. This is evident by the recent introduction of new treatments and foam coatings, mostly dispersant types, such as acrylic and Teflon[®], on fabric media. They do not eliminate the need for a subsurface dust cake.

The major market for the membrane surface media has historically been retro-fitting existing baghouse systems which were experiencing operating difficulties or needed improvements because of process changes. This experience has also proven valuable in recognizing the importance of bag/baghouse interface and many of the things which will prevent any filter media from giving the expected level of performance.

Cost vs. Value

The term “relatively expensive” is quite often applied to surface filtration media. This is true only if the initial price is considered. Before deciding this, all costs or savings related to its use should be considered. Therefore, cost of surface filtration media should be evaluated on its potential economic return rather than this initial price.



What is Surface Filtration?

It is the deposition of all dust, both coarse and fine, on the surface of the filter media, and it eliminates the need for a primary dust cake to be formed on the interstices of the filter media as is necessary with industrial fabric filter media. Surface filtration is accomplished by utilizing a tight, yet porous membrane which gives excellent dust cake release to prevent high operating pressure losses.

What is the ePTFE Membrane Media & How is it Different?

The filtering surface of membrane is a very thin, extremely smooth and microporous film of expanded PTFE.

For durability, the ePTFE membrane is bonded to the surface of a base fabric (the backing material). Many users may remain with the same base media as already installed (e.g. polyester felt, aramid felt, woven fiberglass, etc).



BENEFITS OF ePTFE MEMBRANE FILTRATION

- Reduced Emissions (PM10, PM2.5, and Sub-Micron PM)
- Lower Pressure Drop
- Longer Effective Bag Life
- Good recovery from upset conditions (moisture, boiler tube leaks, system failure, dew point cycling)
- Full collection efficiency upon start up.
- Higher air-to-cloth ratio capabilities reduce capital costs as a result of smaller baghouses.
- Reduced cleaning air consumption
- Fan energy savings

Manmade Dust Cake

Basically, the ePTFE membrane can be thought of as a manmade, quality controlled, factory applied primary dust cake which provides for excellent filtration efficiencies immediately upon putting the ePTFE membrane media into service. Also, the ePTFE membrane serves another function; because it has no loose fiber ends, is hydrophobic (moisture resistant), and has a durable, smooth surface, it provides excellent secondary cake release.

Permeability

The ePTFE membrane media can also be viewed as a preconditioned media. This explains why the permeability of a new piece of ePTFE membrane media is lower than that of new fabric media. The permeability of a new piece of fabric media is higher because it is unconditioned (no primary dust cake beneath the surface of the media), and its permeability will be drastically reduced as soon as it is put into service and starts building a primary dust cake in its interstices. It is for this reason that the performance of medias should not be compared by the same standards unless they are of the same material and construction. This is especially true when predicting the performance of ePTFE membrane media by fabric media standards.

Efficiency

The predictability of the filtration efficiency is also simpler with ePTFE membrane media because the porosity or tightness of the membrane does not change after cleaning.

ePTFE membrane will give the highest attainable filtration efficiency of any filter bag material at the highest air-to-cloth ratios and the smallest particle sizes.