

NAWTEC17-2303

CONTROL OF FINE PARTICULATE MATTER BY MEANS OF HIGH EFFICIENCY ePTFE MEMBRANE FILTER LAMINATES

Gernot G. Pranghofer
W.L.Gore & Associates GmbH
Industrial Dry Filtration
Wernher-von-Braun-Str. 18, 85639 Putzbrunn
Germany
Phone: +49 89 4612 2261, Fax: +49 89 4612 42261
gernot.pranghofer@wlgore.com

Abstract:

The COUNCIL OF THE EUROPEAN UNION has enacted laws to improve the quality of the ambient air: The "COUNCIL DIRECTIVE 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air" and the "DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe".

The Member States had to bring into force the laws, regulations and administrative provisions necessary to comply with these Directives.

These Directives are raising the expectations on the reduction of fine particulate matter on the potential emitters, mainly public traffic, industry and waste-to-energy (WtE) plants.

Although there is currently no European regulation on stack emissions of fine particulate matter, local regulatory authorities have tightened the emission limits of total particulate matter.

For example, quite a number of Italian WtE plants are expected to meet dust emission levels of less than 2 mg/m³.

In order to assure compliance strong efforts and large investments have been made to optimize the efficiency of their APC system.

Different dust filtration technologies will be compared and the filtration principles of depth filtration and surface filtration will be detailed.

A comparison of an experimental study and the practical performance of the different technologies are discussed.

Special focus will be given to the development and application of High Efficiency Membrane Filter Laminates for retention of fine particulate matter.

These filter materials consist of micro-porous expanded PolyTetraFluoroEthylene (ePTFE) membranes laminated onto suitable backing materials, retention rates of > 99.99 % of PM_{2.5} have been achieved.

A number of large European WtE plants have already completed their APC upgrades by using the High Efficiency Membrane Filter Laminates.

Some of them are on operation for a couple of years, performance reviews will be detailed.