Filter Media

The present invention relates to a filter media suitable for removing solid matter from an air flow.

Filter media that incorporate a membrane of expanded polytetrafluoroethylene (ePTFE) are known. The membrane is relatively delicate and is easily damaged during transport and manipulation. Accordingly, a protective scrim is typically provided on one or both sides of the membrane.

An ePTFE membrane is comparatively expensive but is capable of achieving higher separation efficiencies than that of other media for the same pressure drop. The membrane is also relatively good at releasing dust upon washing. Nevertheless, any improvement in dust release will improve the efficacy of the filter media and is therefore desirable.

Summary

In one aspect, the present disclosure refers to a filter media comprising a membrane and a protective scrim secured to a surface of the membrane, wherein the membrane comprises fibres of a first polymer having a diameter less than 1 micron, the scrim comprises fibres of a second polymer, the first polymer has a contact angle greater than 90 degrees, and the second polymer has a contact angle less than 90 degrees.

The membrane is therefore formed of hydrophobic fibres, and the scrim is formed of hydrophilic fibres. By employing a membrane that comprises fibres less than 1 micron in diameter, a relatively high separation efficiency may be achieved for a relatively low pressure drop. Moreover, by employing hydrophobic fibres, relatively good dust release may be achieved upon washing.

Studies on conventional filter media have shown that, after washing, dust continues to be trapped on the exposed surface of the membrane. Moreover, the dust appears to be concentrated at those regions of the exposed surface that are adjacent the fibres of the

scrim. The present disclosure is predicated on the realisation that the fibres of the scrim are formed of a hydrophobic polymer. The use of hydrophobic fibres seems sensible for a filter media that is intended to be washed. Indeed, it is the hydrophobic properties of the fibres of the membrane that are responsible for the effective dust release on washing. However, by employing hydrophobic fibres for the scrim, the relatively high contact angle inhibits water from penetrating those regions of the membrane that are adjacent the fibres of the scrim. The present disclosure is further predicated on the realisation that by employing a hydrophilic, rather than a hydrophobic, polymer for the scrim, water is better encouraged into those regions of the membrane upon washing and thus increased dust release may be achieved.

The first polymer may be polytetrafluoroethylene. This particular polymer has a relatively high contact angle and thus relatively good dust release may be achieved on washing. More particularly, the membrane may be formed of expanded polytetrafluoroethylene (ePTFE). ePTFE has the advantage that hydrophobic fibres having a diameter less than 1 micron may be mass produced using industrial processes that are relatively mature.

The scrim may have an areal weight of between 10 g/m^2 and 50 g/m^2. This then has the advantage that the scrim is able to provide adequate protection to the membrane without unduly restricting the flow of air through the filter media.

The term ‘fibre’ is used throughout this document and should be understood to include fibrils (such as those found in ePTFE) or other structural features having a diameter of less than 1 micron.

In order that the present invention may be more readily understood, an embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a filter media in accordance with the present invention;