

WHAT IS CLAIMED IS:

1. A catalytic composite, comprising:
a catalytic layered assembly comprising:
a porous catalytic fluoropolymer film having a first, upstream side and a second, downstream side; and
one or more felt batts comprising at least a first felt batt positioned adjacent the upstream side of the porous catalytic fluoropolymer film to form the catalytic composite; wherein the fluoropolymer film is perforated.
2. The composite of claim 1, wherein the one or more felt batts are formed of fleece formed from PTFE staple fiber.
3. The composite of any of the preceding claims, wherein the layered assembly is connected together by a plurality of perforations formed by a needling or needle punching process.
4. The composite of any of the preceding claims, further comprising a porous protective layer disposed on an upstream side of the first felt batt for blocking particulate ingress.
5. The composite of any of the preceding claims, wherein
the fluoropolymer film comprises an expanded polytetrafluoroethylene (ePTFE) film.
6. The composite of any of the preceding claims, wherein the fluoropolymer film comprises catalytic particles suspended in an ePTFE matrix.
7. The composite of any of the preceding claims, wherein each of the one or more felt batts comprises a fluoropolymer.

8. The composite of any of the preceding claims, wherein the fluoropolymer film is perforated in a perforation pattern having a percent open area of at least 0.2%.
9. The composite of any of the preceding claims, wherein the composite has an air permeability corresponding to a flow rate in the range of 0.6 to 21.3 m/min at 124.5 Pa.
10. A filter comprising the composite of any of the preceding claims.
11. A catalytic article, comprising:
a perforated porous polymeric membrane containing therein a catalytic material.
12. The catalytic article of claim 11, wherein the perforated porous membrane has a microstructure comprising fibrils.
13. The catalytic article of claim 12, wherein the catalytic material is enmeshed with the fibrils of the microstructure.
14. The catalytic article of any of the preceding claims, wherein the catalytic material extends into pores of the perforated porous polymeric membrane.
15. A method of forming a catalytic composite, comprising:
forming a catalytic layered assembly by layering a porous catalytic fluoropolymer film with a first felt batt on a first side of the porous catalytic fluoropolymer film;
connecting the porous catalytic fluoropolymer film with the first felt batt to form a multilayered composite; and
perforating the fluoropolymer film, such that the multilayered composite has a minimum air permeability of at least 0.6 m/min at 124.5 Pa.

16. The method of any of the preceding claims, further comprising:
adding a porous protective membrane to the layered assembly adjacent the first felt batt and opposite the porous catalytic fluoropolymer film.
17. The method of any of the preceding claims, wherein perforating the fluoropolymer film further comprises needling or needle punching a perforation pattern into the fluoropolymer film and/or into the fluoropolymer composite to an open area of at least 0.2%.
18. A method of filtering a fluid, the method comprising:
providing a catalytic filter comprising:
a catalytic layered assembly comprising a porous catalytic fluoropolymer film; and
at least one felt batts positioned adjacent the fluoropolymer film,
wherein the fluoropolymer film is perforated;
placing the filter in a fluid stream and oriented with the scrim upstream of the fluoropolymer film with respect to a flow direction of the fluid stream; and
passing the fluid stream through the catalytic filter.