What is claimed is

1. A coated porous filtration membrane, wherein at least one surface of the membrane is coated with a fluoropolymer-based emulsion,
wherein said fluoropolymer-based emulsion comprises an acrylic modified fluoropolymer (AMF) having a fluoropolymer seed.

2. The coated porous filtration membrane of claim 1, wherein said fluoropolymer seed comprises a polyvinylidene homopolymer or copolymer comprising at least 70 weight percent of vinylidene fluoride monomer units.

3. The coated porous filtration membrane of any of claims 1 or 2, wherein said fluoropolymer-based emulsion comprises a blend of 1 to 40 weight percent of one or more acrylic polymer, and 60 to 99 weight percent of one of more fluoropolymers, based on the total weight of acrylic polymer and fluoropolymer.

4. The coated porous filtration membrane of any of claims 1-3, wherein said fluoropolymer-based coating has a dry thickness of from 0.1 to 10 microns, preferably from 0.3 to 3 microns.

5. The coated porous filtration membrane of any of claims 1-4, wherein said membrane is a polymeric material chosen among: cellulose esters, polyimides, polyamides, polycarbonates, polysulfone, polyethersulfone, polyacrylonitrile, polyethylene, polypropylene, polyether ether ketone, polyether ketone, fluoropolymers and combinations thereof.

6. The coated porous filtration membrane of any of claims 1-5, wherein said membrane is made of polyvinylidene fluoride (PVDF) homopolymer or copolymers of vinylidene fluoride with one or more monomers selected from the group consisting of vinyl fluoride,

trifluoroethene, tetrafluoroethene, one or more of partly or fully fluorinated alpha-olefins such as 3,3,3-trifluoro-1-propene, 1,2,3,3,3-pentafluoropropene, 3,3,3,4,4-pentafluoro-1-butene, and hexafluoropropene, the partly fluorinated olefin hexafluoroisobutylene, perfluorinated vinyl ethers, such as perfluoromethyl vinyl ether, perfluoroethyl vinyl ether, perfluoro-n-propyl vinyl ether, and perfluoro-2-propoxypropyl vinyl ether, fluorinated dioxoles, allylic, partly fluorinated allylic, and fluorinated allylic monomers.

7. A process for manufacturing the coated membrane of any of claims 1-6, comprising the steps of:

i. providing a porous filtration membrane;
ii. providing a fluoropolymer-based emulsion comprising an acrylic modified fluoropolymer (AMF) having a fluoropolymer seed;
iii. coating said membrane in said emulsion for a period sufficient to allow the membrane to become wet, followed by air drying of the wet membrane, and
iv. heat drying the membrane to remove residual water.

8. The process of claim 7, further comprising a preliminary step of wetting the membrane in an organic solvent prior to step iii.

9. The process of any of claims 7 - 8, in which step iv is performed at a temperature comprised between 50 to 100°C.

10. The use of the coated filtration porous membrane according to any of claims 1 to 6 or prepared according to the process of any of claims 7 to 9, for water purification, purification of biological fluids, wastewater treatment, osmotic distillation, and process fluid filtration.

11. The use of claim 10 for membrane distillation, wherein the fluoropolymer-based emulsion used for coating the membrane is hydrophobic.

12. The use of claim 10 for ultrafiltration.