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# Supporting Information

**Internal Polymer Pore Functionalization through Coated Particle Templating affords Fluorine-Free Green Functional Textiles**

*Mario Stucki, Christoph R. Kellenberger and Wendelin J. Stark**

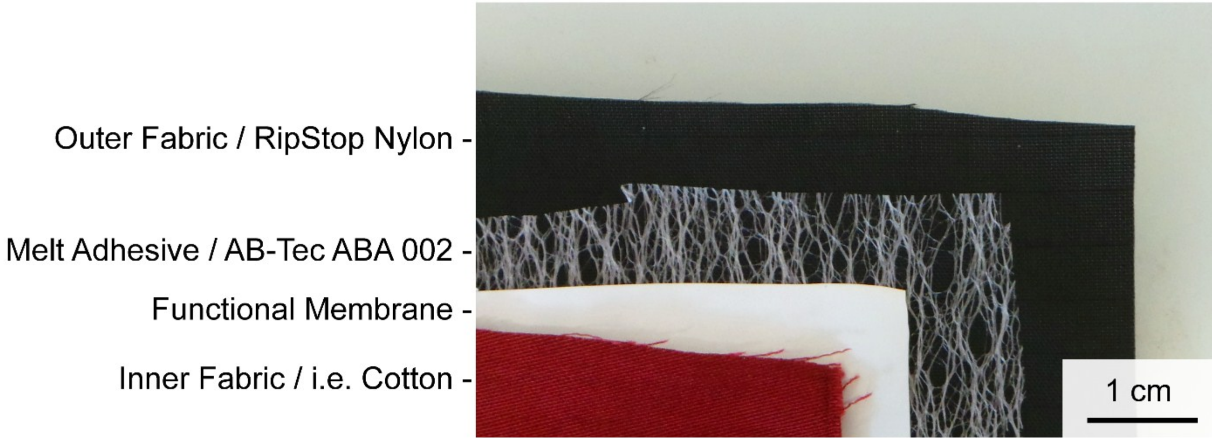


**Figure S1.** A typical built-up of a 3 layer laminate. The shown materials are exemplary, many variations are used.

**Table S1.** Membranes of different thickness where measured before and after removal of the template particles. The two and three dimensional loss is noted for each thickness.

| *Thickness / µm* | *Lost Area / %* | *Lost Volume / %* |
|---|---|---|
| *11.9* | 12 ± 4 | 42 ± 15 |
| *18.1* | 10 ± 1 | 41 ± 6 |
| *29.8* | 11 ± 1 | 37 ± 3 |
| *43.5* | 11 ± 4 | - |
| *49.8* | 12 ± 1 | 28 ± 9 |

**Table S2.** Tensile properties of nylon fabric woven in a RipStop way and the laminate used in the prototype, which consists of the nylon fabric, a polymeric adhesive and the membrane presented herein made with coated template particles.

| | RipStop Nylon Fabric | Ripstop Laminate with Membrane |
|---|---|---|
| Stress at Break / MPa | 91 ± 3 | 74 ± 3 |
| Break Strain / % | 44 ± 5 | 39 ± 5 |

**Table S3.** A comparison of the needed chemicals in the production process of Gore Tex, the market leader in functional membranes, and the process presented herein.

| **Gore Tex** | **This work** |
|---|---|
| Perfluorooctanesulfonyl fluoride or similar fluorinated surfactant | N,N-Dimethylacetamide |
| Tetrafluoroethylene | Stearic Acid |
| Ammonium persulfate or similar initiator systems | Limestone |
| Polyurethane | Polyurethane |

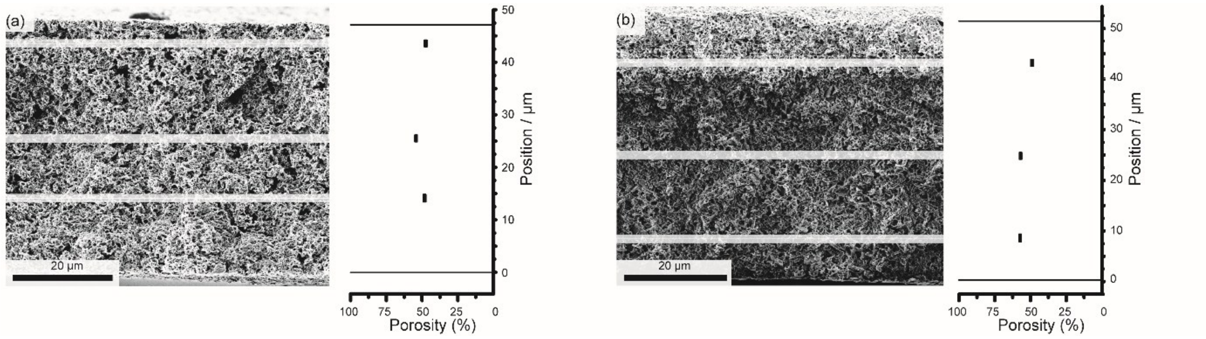


**Figure S2.** The porosity in a cut view of a membrane produced with coated template particles (a) and with uncoated template particles (b). To the right the respective porosity on the white line is shown along with its position within the membrane.

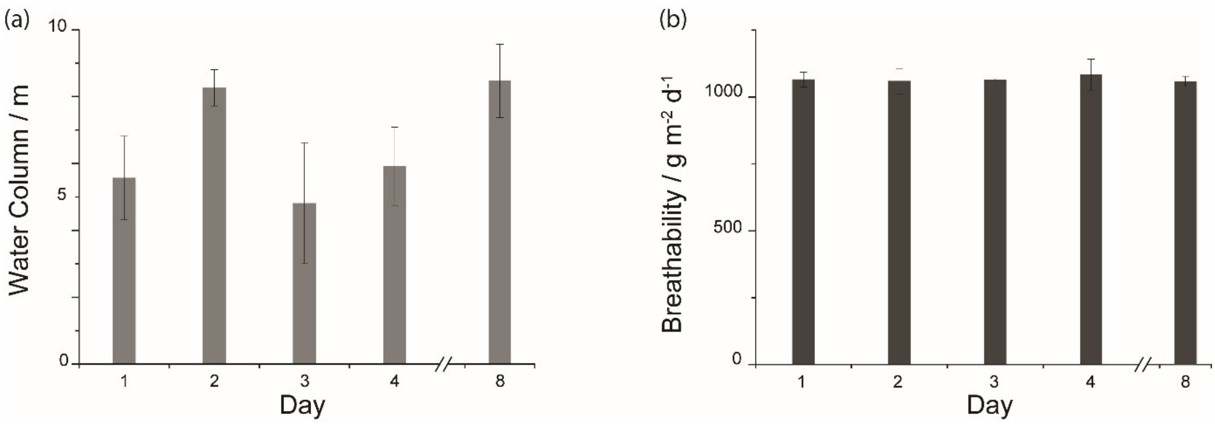


**Figure S3.** Process robustness and dispersion stability was tested by preparing a coated-limestone/polyurethane dispersion, withdrawing samples over 8 days, and directly producing membranes. Both waterproofing (a) and breathability (b) remain within acceptable values and confirm the stability of the dispersion and adequate process robustness.

**Figure S4.** Laminate of nylon fabric, polymer adhesive and membrane (produced with coated template particles), which was ripped in a tensile test.

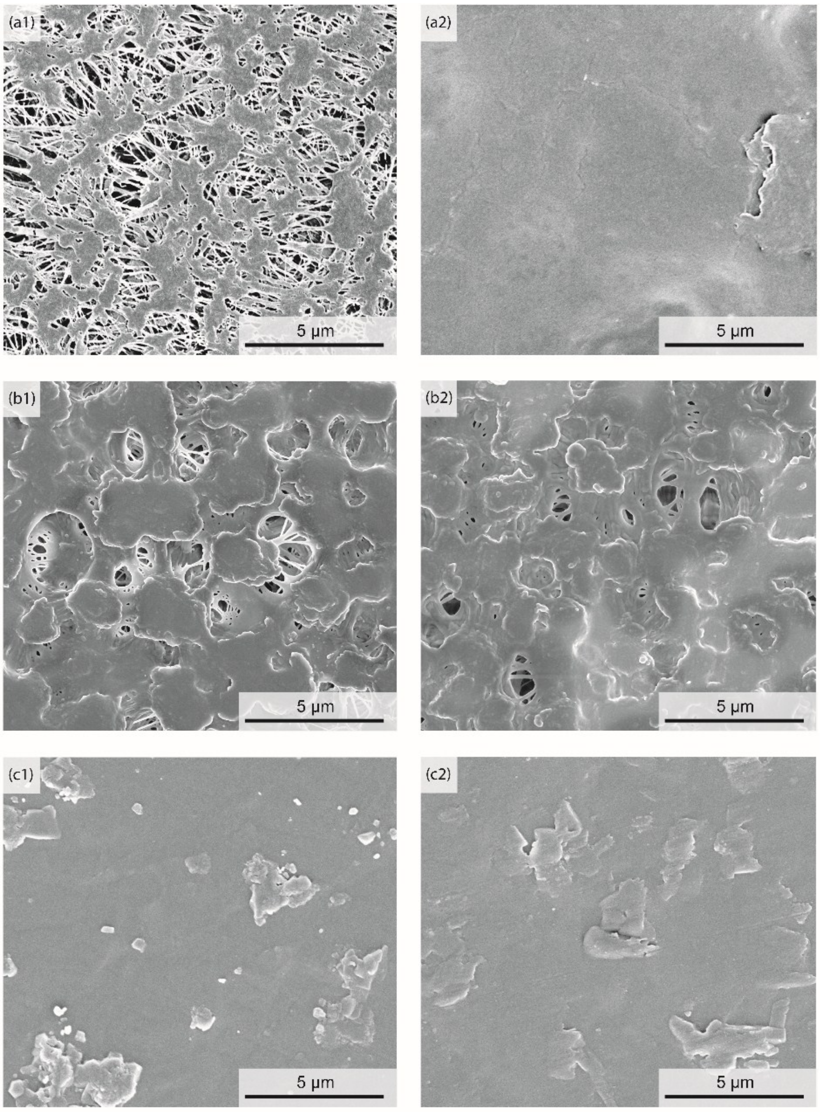


**Figure S5.** Top and bottom side of commercial membranes. (a1) shows the top side of the Gore-Tex membrane made of expanded PTFE. (a2) shows the bottom side of the Gore-Tex membrane made of solid polyurethane. (b1) Shows the top side of the ProPore membrane made from polypropylene. (b2) shows the bottom side of the ProPore membrane. (c1) the top side of the Sympatex membrane made from a copolymer consisting of polyether and polyesters. (c2) the bottom side of the Sympatex membrane.