

Abstract Submitted  
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**Deposition of a-C:H:N plasma polymer thin films for the functionalization of textiles** SEBASTIEN GUIMOND, DIRK HEGEMANN, Empa — Plasma processing is seen as an attractive alternative method to add new functionalities to textiles since it is a versatile and dry technology. Because plasma processing results in a nano-scaled surface modification, it also has the advantage of preserving the bulk properties of the textiles. In this study, plasma polymer thin films have been deposited on various polyester fabrics of defined structure using NH<sub>3</sub>/C<sub>2</sub>H<sub>4</sub> low pressure RF glow discharges. The films were characterized using XPS, FTIR and AFM as a function of the plasma process parameters. For a defined range of energy input and NH<sub>3</sub>/C<sub>2</sub>H<sub>4</sub> gas flow ratio, the coatings are nanoporous and contain amine functional groups. These films can thus serve as high specific surface area templates for further surface functionalization. For instance, the amine groups contained in the films were used to covalently bind molecules containing OH and CF<sub>3</sub> end-groups, giving the fabrics hydrophilic or hydrophobic properties, respectively. The properties of the coated fabrics remain generally rather stable during abrasion tests, presumably due to the high crosslinking degree of the films. The scalability of the process investigated in this work has been demonstrated using a pilot-scale continuous web coater.

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