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| Journal of Visualized Experiments | Dr.in Lisa-Marie Faller, MSc | |
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|  | Klagenfurt, 26.06.2018 | |

Dear Editor and Reviewers,

I wish to submit an invited manuscript entitled “Hybrid Printing for the Fabrication of Smart Sensors” for consideration by the Journal of Visualized Experiments.

In this paper, we report on a fabrication strategy to build cost efficient and smart sensor prototypes based on additively manufactured and foil substrates for multilayer inkjet-printing.

Such substrates can enable and alleviate the fabrication of smart and functional packages, implants or spare parts. To fabricate functional devices, a multilayer structure composed of an insulating layer and a superposed conductive layer is inkjet-printed onto the various substrates. Additionally, also the interconnects are fabricated in an additive manner using, e.g., low temperature curable conductive adhesive.

The printing and respective curing are done using adapted settings for all of the substrates. The characterization is based on microscopic and focused ion beam analyses, as well as profilometer and contact angle measurements of the substrates. Furthermore, microscopic images and four-point-probe resistance- and profilometer measurements are carried out, to gain insight into the quality of the multilayer print and the substrates’ surface as well as bulk structures. We show the diversity of 3D-printed substrates, even for those, which are fabricated using the same process. Additionally, the crucial process parameters and steps are elaborated.

Finally, we can also demonstrate the high quality of measurements acquired with the fabricated prototypes, based on a sensor employing a capacitive measurement principle.

Please address all correspondence concerning this manuscript to me at Lisa-Marie.Faller@aau.at.

Thank you for your consideration of this manuscript.

Sincerely,

Lisa-Marie Faller