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|  | Klagenfurt, 18.09.2018 | |

Dear Editor and Reviewers,

Thank you very much for your valuable comments, we revised the manuscript as requested. In the following, the respective points are addressed invidually.

**Editorial Comments**:

1. The manuscript was proof-read by three individuals and their suggestions have been incorporated in the text.
2. Lines 41-44 have been rephrased.
3. The copyright permission has been obtained and is uploaded.
4. Unnecessary legends and titles have been removed (the remaining are necessary to identify the measurements belonging to the respective substrates).
5. Waviness was added in the legend.
6. Color arrows have been added.
7. Spaces have been included.
8. Tables have been separated.
9. Table 4 has been filled with the respective data and uploaded.
10. E-mail addresses were added.
11. The appropriate abbreviations were used throughout the text.
12. Spaces were added as recommended.
13. All commercial language was removed from the text.
14. The protocol was revised to contain only action items. In cases where appropriate notes were added.
15. The steps of the protocol were extended as recommended. In few cases, the description of the full procedure would lengthen the text unnecessarily so that a note was added which refers the reader to the user manual of the respective equipment.
16. – 27. All of the details were added in the text and the respective substeps were added accordingly.
17. -30. 2.75 pages of the protocol were highlighted using complete sentences and subclauses.
18. Parts of the discussion Section were moved to the Section on representative results and adopted.
19. References were corrected.
20. Supplementary files were referenced in the text.

**Reviewer #1**:

1. The Introduction part has been modified accordingly.
2. Regarding the state of the art: there is no comprehensive study which reviews the combination of inkjet-printing on 3D-printed metal substrates. Literature was added presenting further state-of-the-art in terms of metal 3D-printing.
3. Our work presents a study on the combination of 3D-printed substrates, and especially metal substrates, and multilayer inkjet-printing.
4. A paragraph was added which states the content of the following Sections.
5. The format of the protocol Section is as required by the publisher and respective Editors, so that this part can’t be changed in its structure.
6. We have shown the suitability for multilayer inkjet-printing by fabricating functional, i.e. conductive and structurally intact conductive layers on insulating layers on 3D-printed metal substrate.
7. We did not measure specifically the porosity of our substrates. However, we know from the details of the LCM fabrication process that it yields homogenous surfaces which is further proven through the surface roughness measurements. In contrast, the binder jetting process yields samples which exhibit much higher surface roughness. Additionally, it can be seen from the dropsize tests that none of the used ink remained on the surface of the substrate. We may thus conclude that all of the ink diffused into the substrate.
8. It is known that polymers exhibit weak heat absorption properties, this is the principle on which photonic curing is based: The conductive tracks are heated excessively on the polymer substrate, but the substrate does not suffer due to its weak heat absorption. Depending on the reflectivity of the substrate surface, where darker surface means less reflectivity, we have to adjust the used photonic energy of the curing equipment. For less reflective substrates saw that we need/can use higher energies whereas for more reflective substrates we have to reduce the used energy. The conductive tracks are printed onto an insulator which itself is printed onto the reflective metal substrate. By qualitative inspection, we found that the insulating polymer layer is not negatively affected by the curing, only the metal layer above delaminates. Thus, we conclude that is due to the combination of high reflectivity of the substrate and weak heat absorption of the insulator.
9. During our fabrication processes we found that it is important to let samples dry before performing the photonic curing. If photonic curing is done readily after printing, and the printed tracks are still excessively wet, the solvent will evaporate instantaneously under the high amount of energy introduced (and the resulting heat), leaving deficiencies in the conductive track.
10. We include your review paper published in Manufacturing Review as well as the review on printed sensors on flexible substrates.

**Reviewer #2**:

Our manuscript was proof-read by three individuals. Besides minor comments regarding style, they had no objections.

As stated in the introduction of the manuscript, in a common understanding additive manufacturing can be considered as all processes where material is added instead of removed ( such as is done in semiconductor manufacturing).

In contrast to this, the ASTM standard terms all processes AM which are based on a digital model or drawing of the desired sample.

**Reviewer #3**:

1. We added a discussion of metal 3D-printing to our introduction.
2. We added elaborations on inkjet-printing of metal nanoparticles and size-dependent melting temperature drop and references to the introduction.
3. We added also laser-based technologies and references to the introduction part.
4. The mentioned steps of the protocol have been properly extended.
5. A dummy substrate is a substrate which is used only for the sake of experimental determination of parameters and is not used for the fabrication of functional parts.
6. The used conductive paste is given in the Table of Materials. It is a polyurethane-based paste which can be stored at room temperature.
7. This terms has been replaced. The fineplacer is an equipment for micro-assembly and dispensing. It can be used to dispense pastes and solders and assemble SMD parts onto printed circuit boards. The commercially available system which is used in this work is given in the Table of Materials.

Thank you for consideration of our manuscript.

Sincerely,

Lisa-Marie Faller