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Short Communication

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Exploring the use of 3D printing technology in the fabrication of personalised lipstick applicators

Abstract

This study explores the viability of applying commercially available 3D scanning and printing equipment in the development and manufacture of a personalised lipstick applicator. The shade of a lipstick and its theology are already subject to personalisation. However, the application can be achieved in a more convenient way than using a standardised swivel-up tube. The objective of this project was to examine the possibility of developing a methodology for manufacturing an innovative personalised lipstick applicator using 3D printing technology.

Keywords: acrylonitrile, UV laser, lipstick, formlab resin

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Abbreviations: FDM, fused deposition modelling technology; SLA, stereo lithography technology; ABS, acrylonitrile butadiene styrene; PLA, polylactic acid

Introduction

3D scanning enables the creation of the 3D digital image of an object. Based on the 3D image, the 3D printing process fabricates the object by either cross inking layers of the material using UV laser (Stereo lithography Technology, SLA),[1] or depositing layers of a heated material (Fused Deposition Modelling Technology, FDM).[2]

This case study examines and compares the potential of using these two 3D printing techniques, and three different materials for making the personalised applicator: Acrylonitrile Butadiene Styrene (ABS), Polylactic acid (PLA) and a clear Formlab resin.

Results and discussion

In order to collect digital data of an individual's lips, a scan of the lips was performed, (Figure 1A). Raw digital data of the lips profile were obtained in the scanner software and used to create a digital image model of the lips (Figure 1B). The digital image model of the lips was subsequently transferred to a 3D computer graphics software, Autodesk 3ds Max (Autodesk, US), and then subjected to optimisation and modelling.

It was envisaged that to obtain a personalised lipstick applicator, three elements would be required: a lipstick mould, base and cap. For the purpose of selecting the most suitable 3D printing method for producing personalised lipstick, the three lipstick applicator elements were fabricated using SLA and FDM printers (Figure 2). Clear V2 Formlab resin was used as the printing material for the SLA printer whereas ABS and PLA filaments were used for the FDM printer. The printing setting parameters for V2 Formlab resin were as follows: single layer thickness 0.1mm; activated supports. The settings for printing were as follows: for ABS, platform temperature 100°C, printing temperature 230°C; and for PLA, platform temperature 60°C, printing temperature 210°C. Both plastics were printed in a single mode of printing, high resolution printing quality with the rafts and supports option deactivated, single layer height 0.10mm, infill 50%, number of shells 2 and printing speed of 150mm/s.

The moulds produced using the three investigated materials were filled with a lipstick formulation, closed with their respected bases, inverted, and placed in a fridge for 15min. After removing the moulds it was found that the personalised lipstick was successfully detached only in the case of the PLA lipstick applicator (Figure 3). It was found that ABS could also be used. However, the lipstick retrieval from the mould was not consistently successful. In the case of the clear resin applicator, the lipstick could not be created on a consistent basis. The lipstick applicator is used by pressing the sculpted lipstick surface to the lips that deposits a uniform coating of the lipstick, thus removing the need for a mirror.

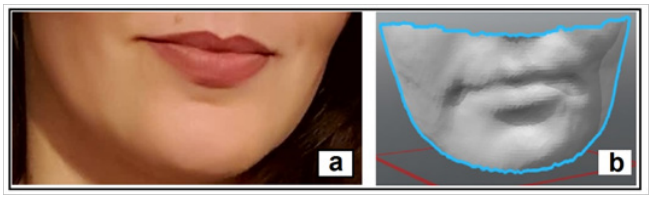

Figure 1 Anindividual' s lips: model **(A)**; Digital image model obtained by scanning **(B).**

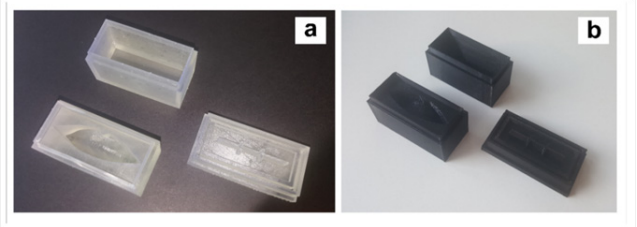

Figure 2 Personalised lipstick applicator elements printed using: the clear resin (A) and ABS (B).

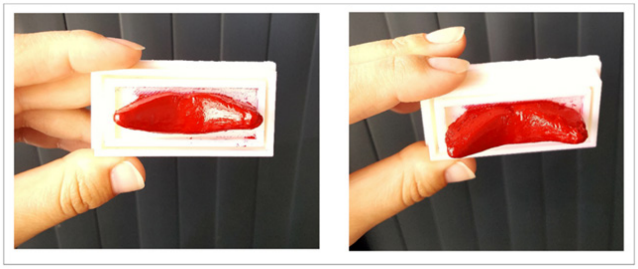

Figure 3 The final lipstick product in PLA base obtained using FDM 3D printing.

Conclusion

It was shown that a novel, bespoke, cosmetic product for the lips a personalised lipstick applicator, can be produced successfully using 3D printing technology. The FDM technique and PLA material were more effective in making personalised lipstick compared to the other studied techniques or materials.

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None.

Conflict of interest

The author declares no conflict of interest.

References

1. Masri R, Driscoll CF. *Clinical Applications of Digital Dental Technology*. USA: John Wiley & Sons; 2015. 250 p.
2. Pucci JU, Christophe BR, Sisti JA, et al. Three-dimensional printing: technologies, applications, and limitations in neurosurgery. *Biotechnology*. 2017;35(5):521–529.

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