

Abstract

Microdispenser 3D Printing

L. Fütterer^{1*}, E. Olsen¹, L. Overmeyer^{1,2}, G. Hohenhoff², S. Kaierle^{1,2}, T. Doll³, and P.C. Pott⁴

¹ Institute of Transport and Automation Technology, Leibniz University Hannover, Hanover, Germany

² Laser Zentrum Hannover e.V., Hanover, Germany

³ Biomaterial Engineering, Otolaryngology, Hannover Medical School, Hanover, Germany

⁴ Clinic for Dental Prosthetics and Biomedical Materials Science, Hannover Medical School, Hanover, Germany

* Corresponding author, email: laura.fuetterer@ita.uni-hannover.de

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Dispensing various materials into three-dimensional structures by automatically guiding a microdispenser is used in many industrial applications. Printing a variety of biomaterials has also been successful [1]. The use of these systems for deployment in dental implantology and otolaryngology mandates a miniaturization process.

In the limited workspace, a microdispenser must be capable of high-precision control since only small tolerance ranges are allowed to achieve suitable shape congruence between implant and bone for successful implantological treatment of patients [2,3].

Apart from miniaturization, dispensing highly viscous materials in small volumes presents formidable challenges [4]. Basic physical phenomena, for example, such as Rayleigh instability, which favors droplet formation of the dispensed material, and shear effects must be controlled and used in a targeted manner.

Innovative concepts to develop a high-precision dispensing head suitable for highly viscous materials must be achieved to overcome these challenges and enable the usage of small three-dimensional dispensed implants during surgery inside the human body.

AUTHOR'S STATEMENT

Conflict of interest: Authors state no conflict of interest.

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