

POSSIBILITIES OF APPLICATION OF 3D PRINTING IN CONTEMPORARY DENTISTRY

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Abstract

Development of 3D printing in medical and dental applications has advanced significantly in recent years. 3D technologies are commercially available, i.e. 3D printing and 3D scanning, allowing dentists to easily scan and record state of hard and soft tissues following 3D printing of dental models or supporting structures-like surgical guides and aligners. Thereafter, dental technicians work with these 3D printed dental models of upper and lower jaw, as they previously have been working with plaster models, and because of attainable high dimensional accuracy of these dental models 3D printing technology found its way in dentistry and will improve both in today's application and will expand the range of possible applications in dentistry.

The aim of this paper is to present stereolithography (SLA) 3D printing technology of dental working models. SLA technology is mainly applied in rapid prototyping, but due to exceptional dimensional accuracy it easily found its application in dentistry, where accuracy is of utmost importance. SLA technology works in layer-by-layer manner, using UV lasers to polymerize, i.e. solidify, liquid photopolymer resin placed in a vat. Only accuracy issue of this technology occurs when using more layers to build a model, i.e. if an error appears at a certain layer it will stack on succeeding layers and will create notable dimensional mismatch. Materials used in this research are grey standard resin, dental model resin, long-term biocompatible clear resin and biocompatible photopolymer resin. Created dental models are used for planning and making dental crowns and bridges.

Keywords

3D printing, 3D scanning, stereolithography, dental applications.

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