
DEVELOPMENT OF THE EXPERIMENTAL METHODOLOGY OF STRAIN MEASUREMENT SIMULATED IN PARTLY-EDENTULOUS ARTIFICIAL MANDIBLE

Aleksa Milovanovic¹, Milos Milosevic¹, Tasko Maneski³, Nenad Mitrovic³, Milan Travica¹, Srdjan Postic^{2*}, Goran Mladenovic³

¹University of Belgrade, Innovation Centre of the Faculty of Mechanical Engineering, 11000 Belgrade, Serbia

² University of Belgrade, School of Dental Medicine, Belgrade, Serbia

³ University of Belgrade, Faculty of Mechanical Engineering, Belgrade, Serbia

*Corresponding author e-mail: srdjan.postic@stomf.bg.ac.rs

Abstract

Examination of strain field underneath the teeth and bone structure of mandible for “in vitro” conditions requires thorough preparation of the examinee and equipment. For the purpose of examination of different regions of partly-edentulous mandible, the design solutions for examination of strain fields located on the determined points have been shown for different types of compensations.

Strain measurement was performed using contactless optical 3D system ARAMIS 2.0. Mandible model with several remaining teeth was additively manufactured using SLA technology. The measurement of acting force was performed using a dynamometer, with the maximum applied force intensity of 800N. The results of this study showed that developed experimental setup enables comparison of influence of different teeth geometries and metal compensation designs to the selected areas of artificial partly-edentulous mandible resulting in specific strain distribution.

Keywords

Dental, strain field, additive manufacturing, optical 3D measurement, ARAMIS