

## STATEMENT

**From:** Assoc. Prof. Hristina Ivanova Arnautska, DMD, PhD, Head of Department of Orthodontics, Faculty of Dental Medicine, Medical University “Prof. D-r Paraskev Stoyanov” – Varna

Internal member of the Scientific Jury in accordance with the Rector’s order

№P-109-559/06.12.21г.

**Regarding :** : A dissertation for conferment of the educational and scientific degree “Doctor” in the field of higher education 7. Health and sports in professional field, 7.2. Dental medicine; Prosthetic Dental Medicine in the Department of Dental Materials Science and Propaedeutics of Prosthetic Dental Medicine, Faculty of Dental Medicine, Medical University – Varna.

**Topic:** „Application of temporary restorations obtained through 3D laser stereolithographic printer “

**Author : Dr. Delyan Krasimirov Georgiev**, doctoral student individual form of education at the Department of Dental Materials Science and Propaedeutics of Prosthetic Dental Medicine, Faculty of Dental Medicine, Medical University – Varna.  
Scientific supervisor : Assoc. Prof. Stoyan Georgiev Katsarov, DMD, PhD

### **Bibliographical data and career development:**

Dr. Delyan Krasimirov Georgiev was born in 21<sup>st</sup> of April 1989 in Varna, Bulgaria. In 2014 he graduates Dental Medicine from the MU-Plovdiv. In 2019 he receives his Master Degree in Prosthodontics. From 2016 he is an assistant professor in the department of Dental Materials Science and Prosthetic Dental Medicine at the Faculty of Dental Medicine, Medical University - Varna. He is a member of the Bulgarian Dental Association. He speaks four foreign languages: English, Russian, Turkish and German.

### **Actuality of the topic and purpose of the set goals and tasks и целесъобразност на поставените цели и задачи**

The PhD thesis examines a current issue from an applied and scientific point of view. During the last years, the requirements towards the developed temporary restorations, which

are prototype to the permanent ones, are significantly increasing. According to their shape, size, location and color we can get an idea of the definite construction and also discuss with the patient the possibilities of correction. Moreover, while the physical parameters of the temporary constructions can very accurately be set through CAD/CAM software through an available model in the dental technician laboratory, the determination of the colors can be accomplished exceptionally subjectively and often leads to inaccuracies and inappropriate selection of the basic color parameters. The possibilities for the creation of resins that proportionally and naturally recreate the color standards, suitable for 3D printer of the temporary fixed restorations, as well as the application of methods allowing the increase of their mechanical-strength qualities, are of great importance for the high demands towards the temporary restorations in the contemporary Dental Medicine.

### **Characteristics and evaluation of the dissertation**

The dissertation is written in 140 pages and is illustrated with 85 figures, 3 tables and 1 application. The bibliography includes 270 literature review sources, 7 of which are in Cyrillic alphabet and 263 of which in Latin alphabet. The bibliographic reference is contemporary, since the titles that predominate are from the last five years.

**Literature review**, consecutively and systematically presents accumulated knowledge for the application of temporary restorations obtained through 3D laser stereolithographic printer. The review ends with conclusions, which point to the insufficient and lack of information regarding the researched theme. This argues the set purpose of the dissertation and the suitably selected four tasks.

**The material and the method** of the experiments are compliant with the performance of the given tasks.

**The results** are well-described and analyzed. Moreover, they are appropriately demonstrated with adequate images, figures and tables.

**In the first task of the study** is investigated the influence of the color of printed, provisional restorations type egg shell . From the results obtained, it is indicative that the use of egg-shell printed crowns from Dental LT Clear Resin® (Formlabs™) will have a significant impact on most of the colors used. This, in general, limits its mass application and for

more accurate reproduction of the desired colors, alternative approaches should be sought so that the resulting colors are as close as possible to the color standards.

**For the second task** different recipes for resins have been developed, reproducing proportionally and lawfully the color standards, logically related to the theory of color formation. The limitations of the newly created resins are that they cannot reproduce a greater variety of colors, and the choice is limited to 7 primary colors, of which only 3 falls within the tolerance of color deviation and are unnoticeable by the untrained eye of the patient.

**The third task** presents comparative analysis of bending strength of the newly obtained resins under the second task. The optimal option for temporary constructions, which achieve both high aesthetic and mechanical characteristics, is the combination White Resin / Dental LT Clear Resin in a ratio of 4/6, corresponding to color B1 / 2M1.

**For the purpose of the fourth task** a methodology for increasing the bending strength of printed temporary restorations through software modification of digital files has been created.

**The 9 conclusions** are a logical consequence of the received results and are outlined with scientific accuracy.

**The contributions** are five in total with original and applied character, since I consider that are correctly formulated and significant by themselves.

**The dissertation is entirely a work of the doctoral student under the supervision of his scientific supervisor.** In relation with the PhD thesis, the author has promoted his scientific work in 4 publications.

**The abstract** is written in 79 pages that are correctly constructed, well-illustrated and responds to the different parts of development, as well as to the requirements and legislation for the development of the academic frame.

### **Conclusion:**

The dissertation of d-r Delyan Georgiev entitled „Application of temporary restorations obtained through 3D laser stereolithographic printer“ is complete and represent its own contribution to the science. The scientific work, as well as the publications on the topic,

show that the doctoral student has theoretical knowledge of the research problem and has the necessary qualities and skills to conduct research independently.

The dissertation fulfills all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria(LDASRB) , the Regulations for its implementation and the relevant Regulations of MU-Varna.

My opinion is that Dr. Georgiev and his dissertation, meet the necessary criteria and deserve to be evaluated positively and I will vote with a convincing "Yes" for the award of educational and scientific degree "Doctor" to Dr. Delyan Georgiev and I recommend to the esteemed Scientific Jury to award the scientific and educational degree "Doctor" in the scientific specialty "Orthopedic Dentistry" to Dr. Delyan Krasimirov Georgiev

04.02.2022 г.

Varna, Bulgaria

Prepared the opinion:



/ Assoc. Prof. Hristina Arnautska, DMD, PhD./