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Abstract

3D printed zirconia material

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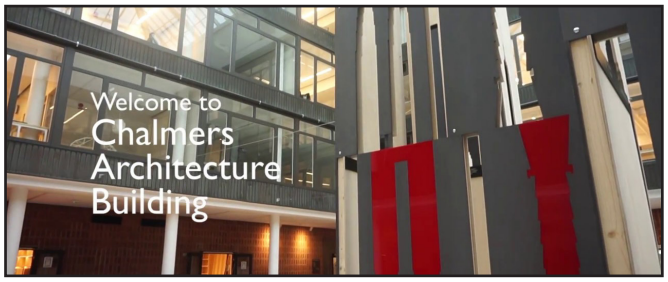
Abstract:

3D printing technology has made great progress in the world as the last 15 years. Biomaterial printing has been the most important part of the life sciences in the world. Dental 3D printing technology is in a relatively advanced position, such as implant guide technology, correction of transparent braces technology; Temporary crown printing technology, at present, the world has also made great progress in 3D dental scanning technology. However, the research and development of 3D printed dental materials around the world is at a relatively early stage. The 3D printed zirconia material I studied has entered the clinical stage. At the same time, in the FDA application stage, the DLP printing principle used for 3D printed zirconia materials. Nano-Material zirconia materials can be fully mixed by photo-curing resin. The main technology is the dispersion is extremely mature.

This technology is mainly focused on completing the permanent crown digital 3D printing at one time, and completing the installation at one time according to different customer needs. The N-M (Nano-Material) zirconia printing material developed is basically divided into three age stages. The first stage is at the age of 3-8, the second stage is at the age of 8-18, and the third stage is at the age of 18-98. Because the hardness index of the teeth of people in different age groups changes, basically the material formula also needs to be adjusted.

The hardness of children at the stage of deciduous teeth is about 85-110 MPs, the hardness of the teeth at the age of 8-18 years is 110-170 MPs, and the hardness of the teeth at the age of 18-98 years is about 110-185 MPs. It mainly depends on different races and different dietary habits, health and medical environments, etc., which have caused some countries and celebrities to be alienated. This research has developed three zirconia hardness printing materials based on three different age stages, which can provide more accurate permanent crown printing services according to different age stages. 3D printed permanent crowns belong to the category of biomaterials, so in the early stage of this research, we paid great attention to the basic requirements of biomaterials, such as biocompatibility, non-toxic basic experiments, weather resistance in the environment of dental bacteria, acid and alkali worth weathering, and temperature. Weatherability. Nano zirconia biomaterials have performed well in clinical trials of permanent crowns. Over 500 cases of clinical installation experiments. After 36 months



of follow-up investigation, the complete rate of 99% has fully proved that nano zirconia resin materials can fully meet the requirements of future permanent crowns This kind of technical requirements can be faster and more accurate to meet the needs of personalized customization. 3D printing technology can replace the existing high-temperature sintering, crystallization, polishing, coloring, and other complex processes of zirconia. The hardness of existing zirconia crystal dentures is about 850-1000 MPs, which is much greater than the hardness of human teeth. Stage zirconia crystalline material can easily damage its own teeth during natural application. The application of 3D printed nano-zirconia materials can maximize the design hardness and maximize the reconstruction occlusion relationship. This is the core of the technology studied in this project.

Biography:

Professor at Xi'an University of Architecture and Technology, PRC.China. He have more interested in 3D printing technology. He ia completed his Ph.D and currently in research field of 3D printing technology.

Publication of speakers:

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