

Custom Mouthpieces for Dental Care

Design for manufacturing of custom toothbrush mouthpieces.



The Dental Robotics Air One is a pneumatic toothbrush, designed to accelerate and simplify plaque removal. Using an inflatable mouthpiece, the toothbrush rapidly cleans all of the user's teeth simultaneously.

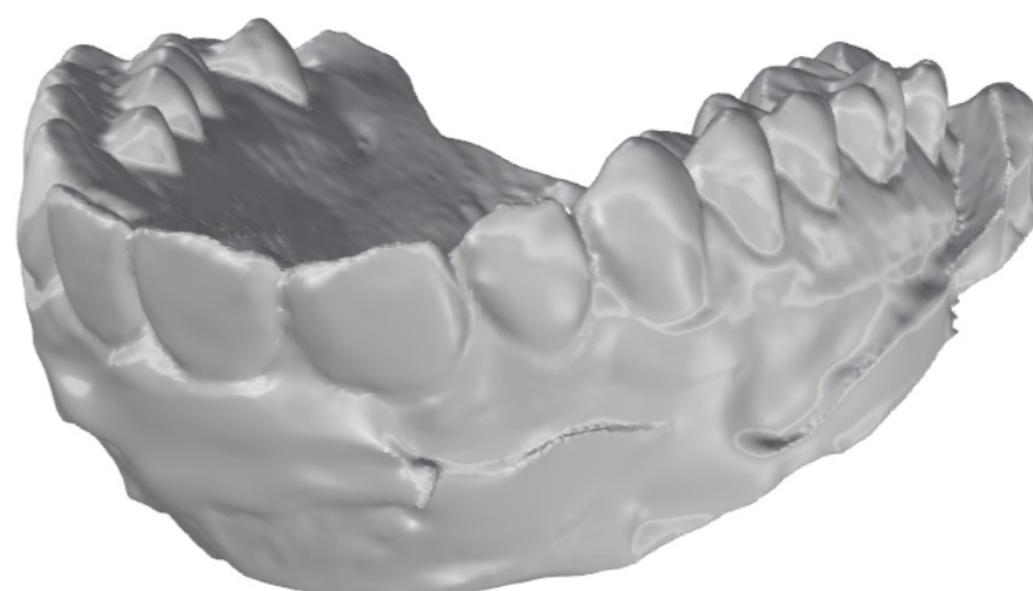


Dental scans from an intra-oral scanner or stone cast can be used to tailor the mouthpiece, enabling custom mouthpiece designs which conform to the dental anatomy of the user.

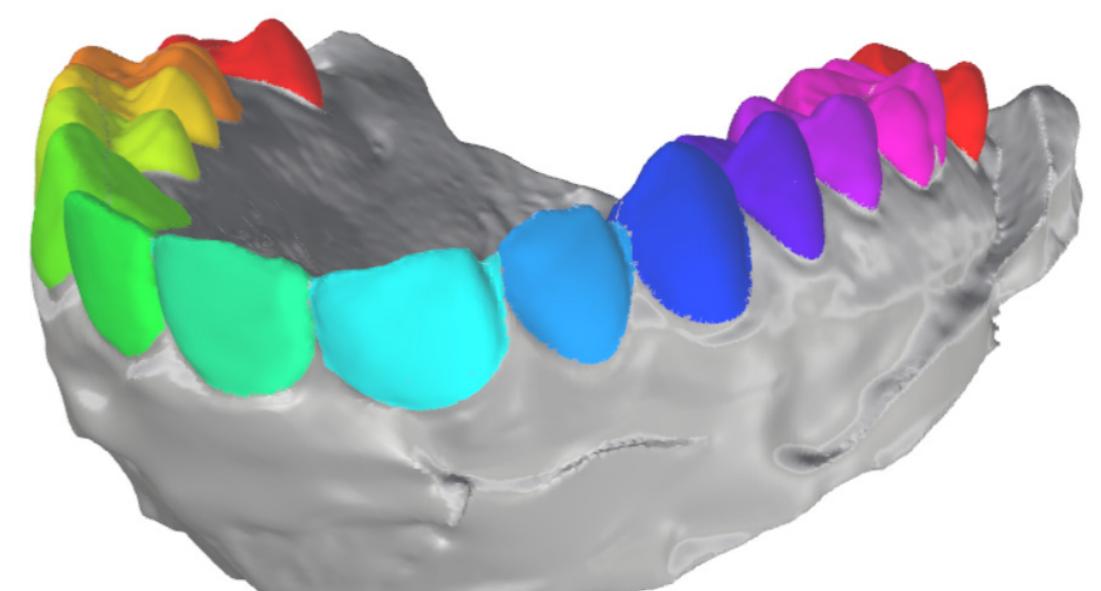
However, even a flexible mouthpiece has its limitations. Reaching the areas between the teeth, as well as the gumlines and the rear molars, present some difficulties. A custom mouthpiece presents a possible solution to this problem.



A mesh processing algorithm is used to automatically generate designs based on the dental scans provided. Region-growing curvature analysis detects individual teeth and gums, and changes the mouthpiece surface model accordingly.



An FDM-printed semi-flexible frame provides structure and support to the mouthpiece. TPU sheets with nylon or moulded tufts are thermoformed over the frame, creating a bristled surface that aligns with the user's teeth.



The resulting mouthpiece outperforms the standard model in several key aspects, including interdental contact and handling of irregular dental anomalies, while remaining economically viable.

