

Partial denture Prosthetic Dentistry for third year

PARTIAL DENTURE : 14. DIGITAL PARTIAL DENTURE DESIGN AND MANUFACTURE

Dr. Azhar Alawadi

Digital designing was revolutionized in 2005 and changed the digital design in dentistry and dental technology. There has been a rapid increase in the employment of Computer-aided design (CAD) and Computer-aided manufacture (CAM) technologies in dental application instead of conventional RPD frameworks, avoiding errors of conventional technique.

Computer-aided technologies allow more precise and systematic modeling, and could therefore reduce the difficult steps of both chair-side and laboratory work, saving vital time.

CAD CAM technologies help in reducing time of the laboratory steps by about 60-70% as there is no need for refractory model and no need for manual waxing up of the framework also the CAD software makes automatic surveying and block out of the undercuts, in addition it is easy and not expensive.

Components of CAD/CAM system:

1. Dental Scanner
2. Computer & Software
3. Manufacture machine

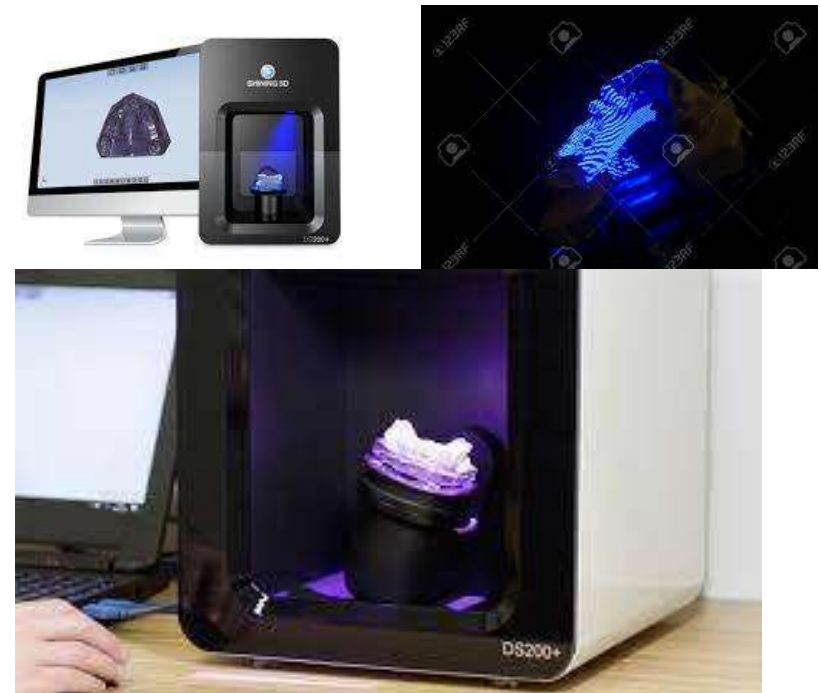
Types of Digital Scanner:

1. Intraoral Scanner

2. Extra oral scanner (dental 3D laboratory scanner).

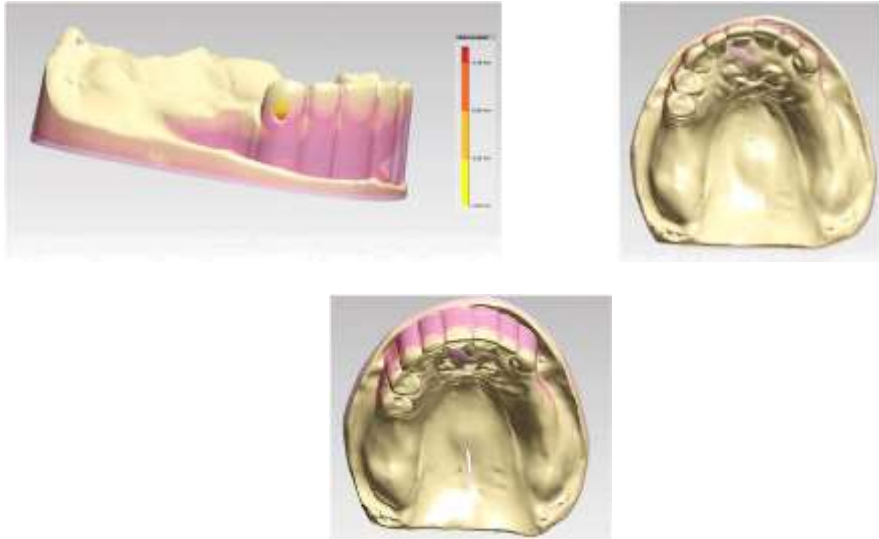
Digital RPD Framework Design (step by step)

- 1.** At the beginning of the digital process of CAD design, the master cast is scanned using a dental scanner.

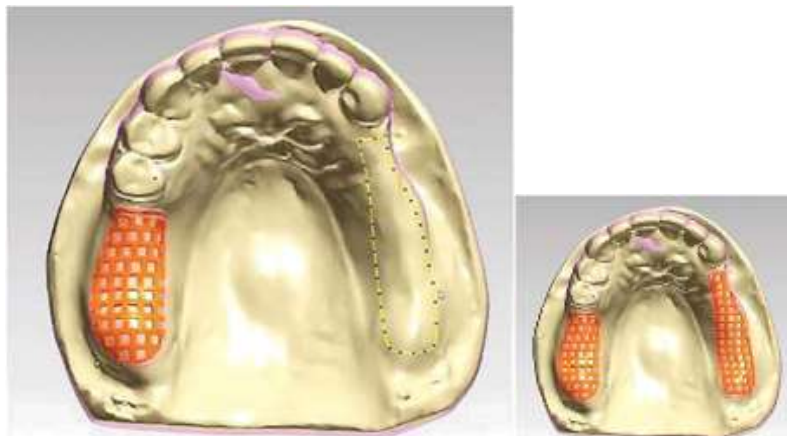


- 2.** After the scan of the master cast complete, the virtual digital image appeared visible on the computer screen.

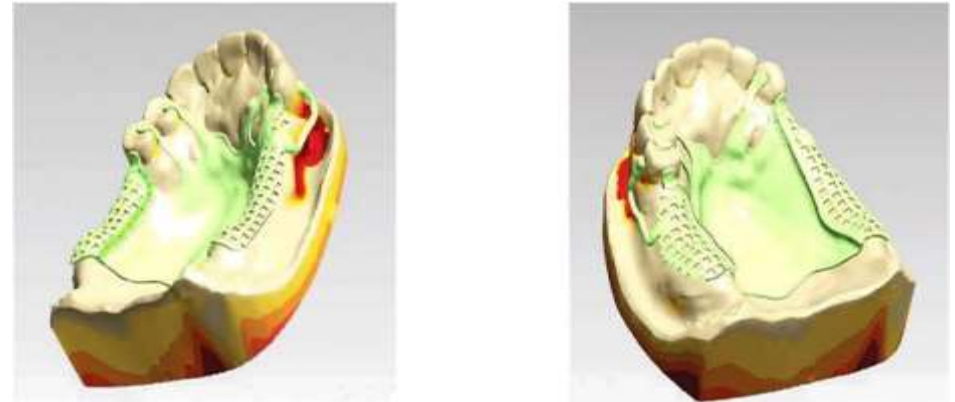
3. Surveying and blocking out of the virtual digital cast.



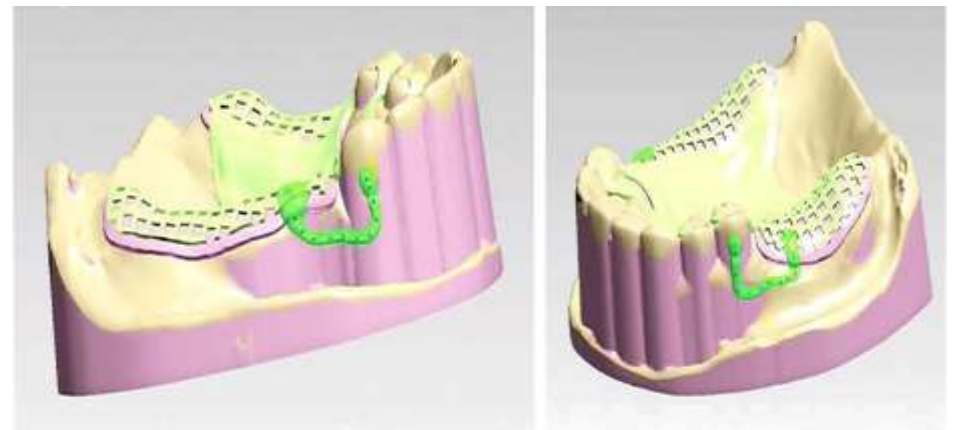
4. Retention gridwork design and relief.



5. Design of major and minor connectors.



6. The buccal clasp arms are outline to the desired clasp contour and shape.



7. The design of the finish line.

8. Support bars are then added to the RPD digital framework at the anterior and posterior segments.



Digital Fabrication Process:

Scan, Design, Print: To begin the digital fabrication process, the maxillary and mandibular models were scanned, and then designed using partial denture design system, as describe previously in 'Digital RPD Framework Design.



Digital designing

Composite or wax pattern milled or 3D printed



Investment of the pattern for metal casting



Metal frame fully manufactured by casing



Metal frame 3D printed