ATTENBOROUGH DENTAL

Revolutionary 21st Century Digital Dentistry

02.05.06

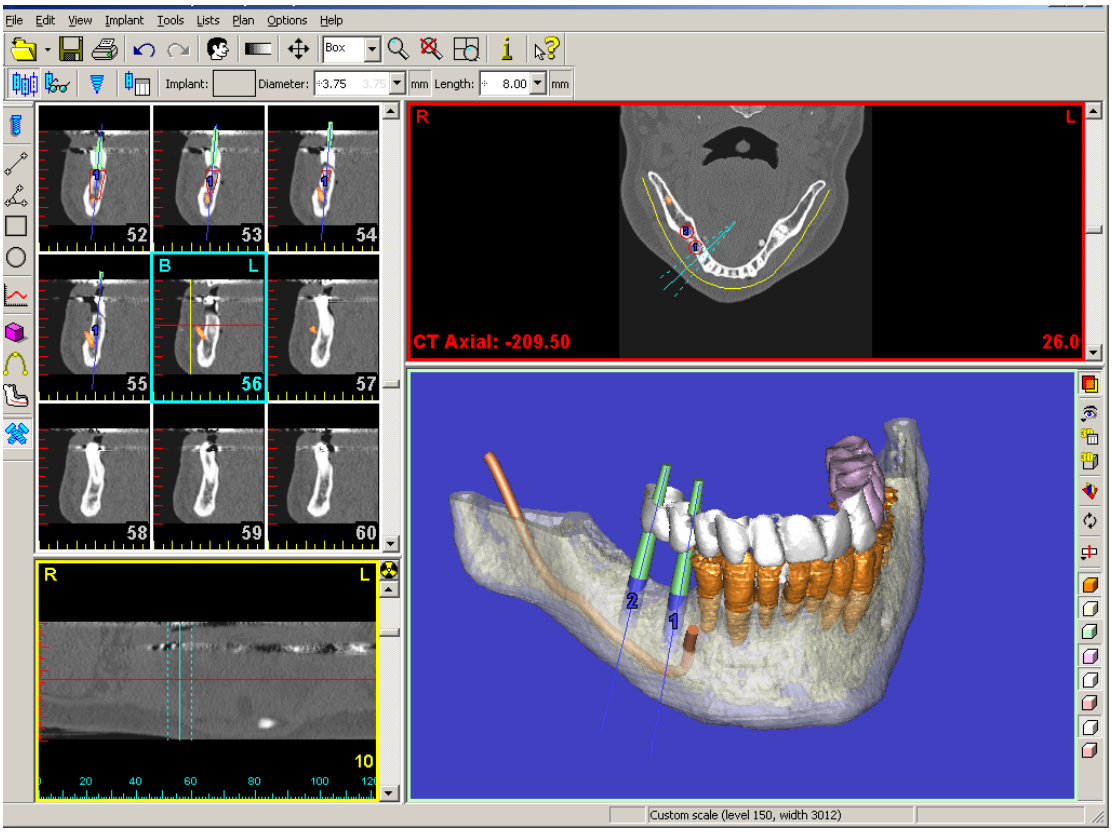
How Does it Work? – A Brief Overview

We merge computed patient tomography data with laser model scanning data to give a composite 3-dimensional image with the requisite 15-micron precision surface scan and the insight of penetrative bone density recording.

We use bespoke CAD to model and design a new smile for the patient, before exporting to 3 separate CAM manufacturing processes, which we have developed and applied as follows:

1. Subtractive milling of solid titanium
2. Investment casting of photopolymer models
3. Investment casting of wax jet models

We hand veneer the resultant frameworks with special ceramics to give a premier private quality restoration at an NHS price.

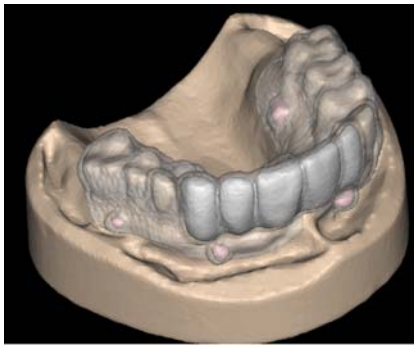


(1) Composite 3-Dimensional Image from CT scan of patient (accuracy ~500 micron)

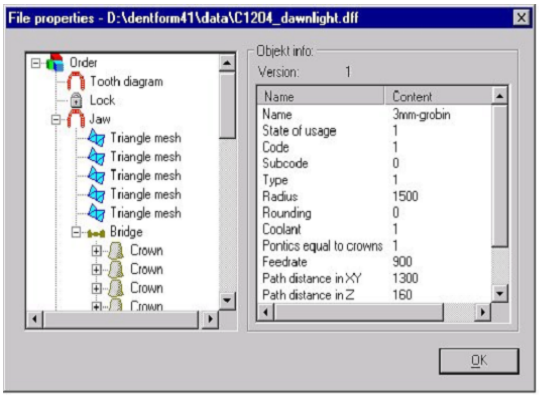
(2) Laser Scanning Device

(3) Laser Scan of Plaster Cast from patient impression (accuracy ~15 micron)

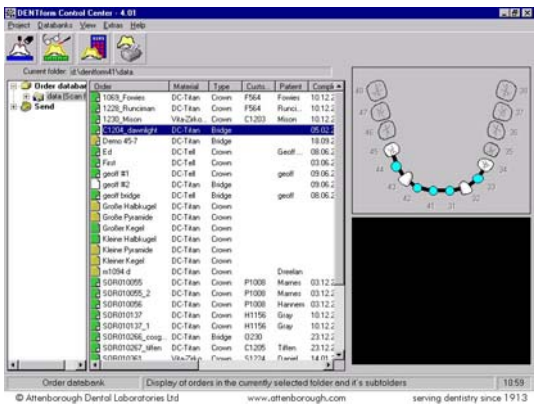
(3) Thermoform with registration markers



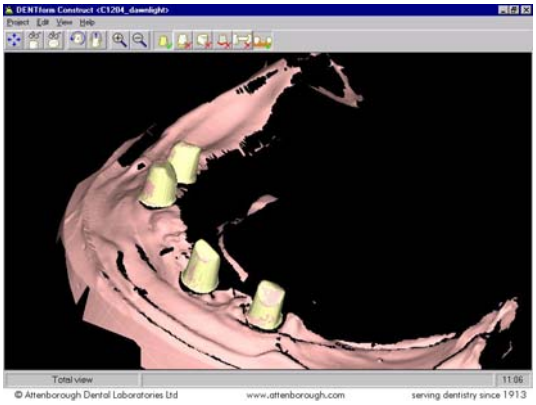
(4) Computerized image of scanned cast with stent



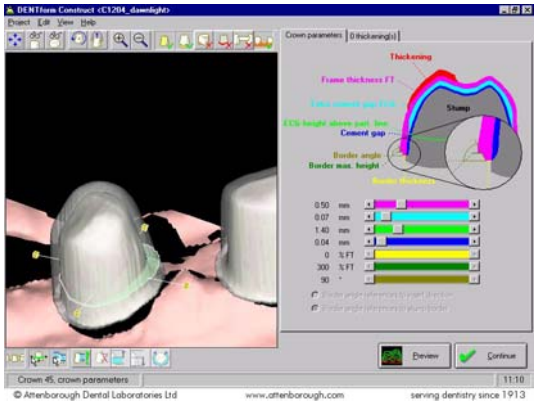
(5) Merging of CT and Laser Scan Datasets to form accurate 3-D triangle mesh



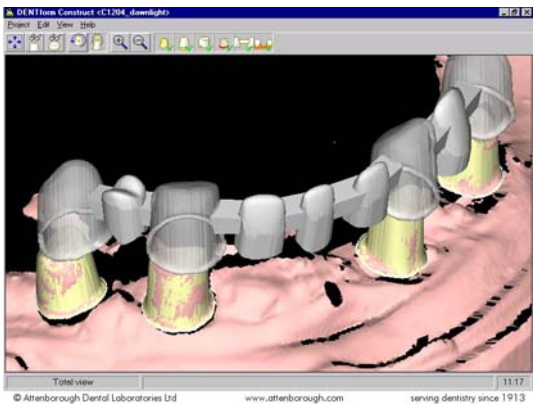
(6) Digital prosthetic treatment plan



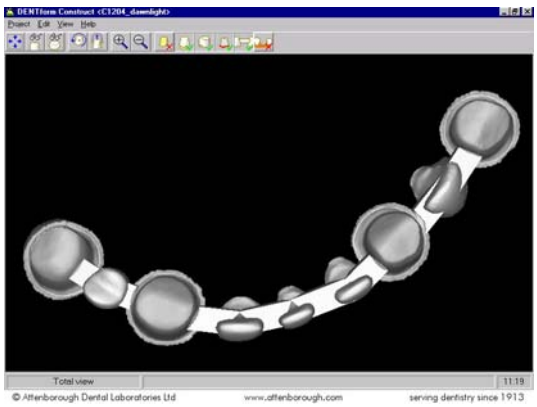
(7) Virtual Model of Patient



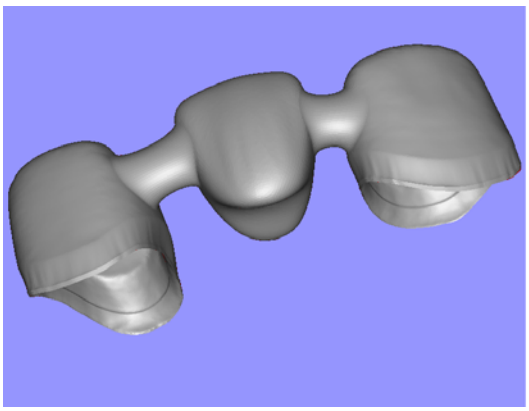
(8) Design of Individual Copings in CAD



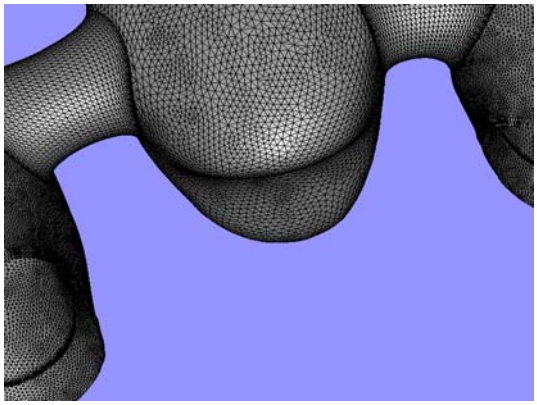
(9) Design of Bridge Framework in CAD



(10) Completed Design Process

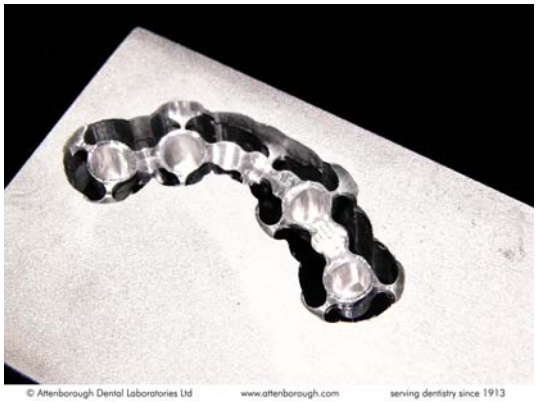


(11) Composite High-Res 3-D Restoration Image

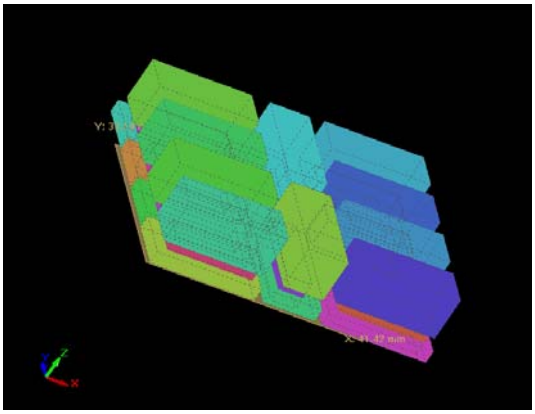


(12) 3-D Triangle Image Mesh Detail

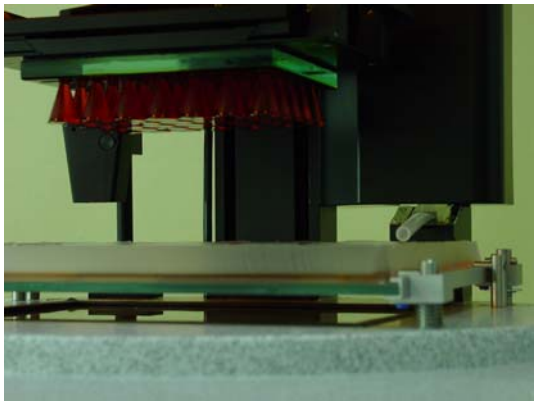
(13) **Manufacture Method#1** : CAM Subtractive Milling of Bridge Framework



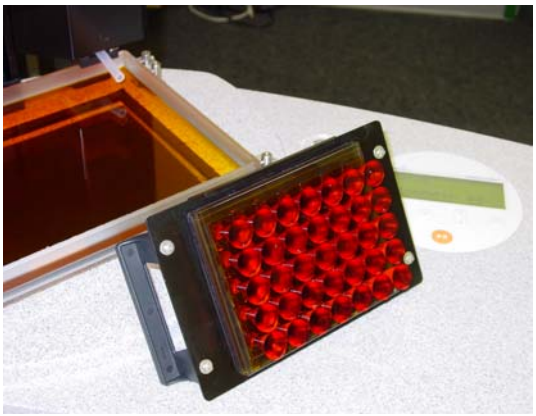
(14) Finished titanium framework before removal from mother material



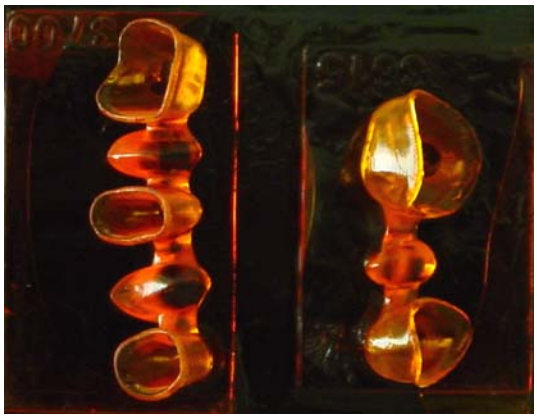
(15) Mass Production Build plan



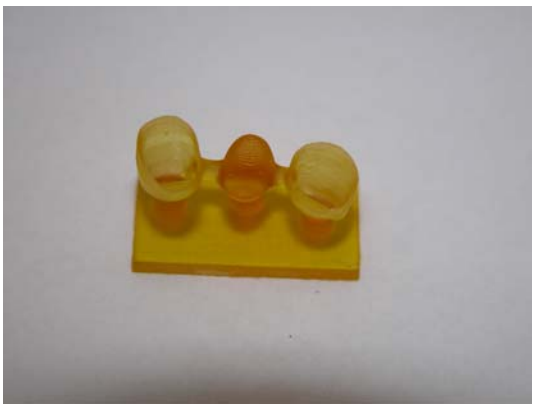
(16) **Manufacture Method #2** : Photopolymer RP Framework Build



(17) Test mass production build



(18) Resultant photopolymer builds

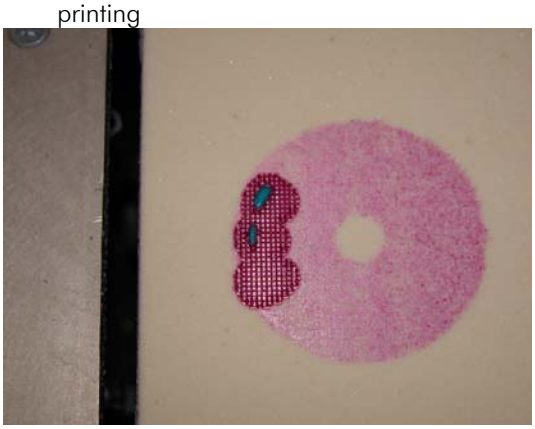


(19) 3-unit photopolymer bridge framework

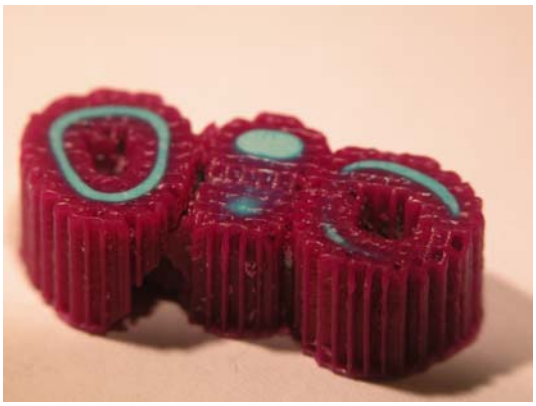
(20) 3-unit photopolymer bridge framework detail

(21) **Manufacture Method #3**: 3-D wax jet printing

(22) Detail of wax bridge framework build

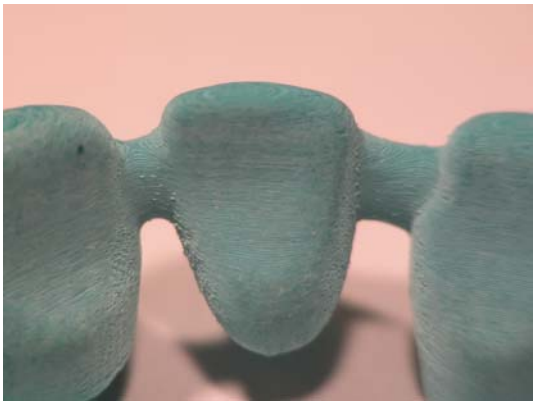


(23) Detail showing wax support structure build



(24) Finished wax build with framework in blue wax embedded in red wax support

(25) 3-unit wax bridge framework after dissolving red wax support structure

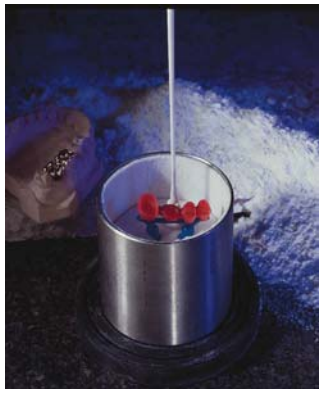


(26) 3-unit wax bridge framework detail (note improved resolution over photopolymer)

(27) Wax pattern, reservoir and sprue ready for investing

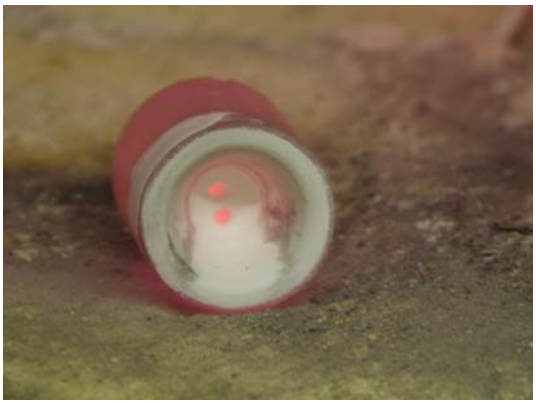
(28) Lined casting ring

(29) Applying in vestment by hand to delicate areas before investing



(30) Pattern investment

(31) Set investment in ring



(32) Red-hot casting ring after wax burn out

(33) Induction melting alloy and centrifugal casting

(34) Casting after divestment

(35) Casting after sandblasting and glass beading

(36) Early cast showing flashing due to photopolymer expansion investment cracking

(37) Later photopolymer cast after matching investment expansion coefficients

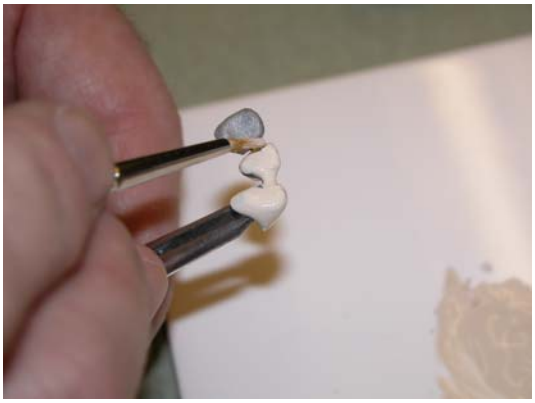
(38) Perfect fit to original model

(39) Casting from wax jet model – note improved quality due to wax burn out

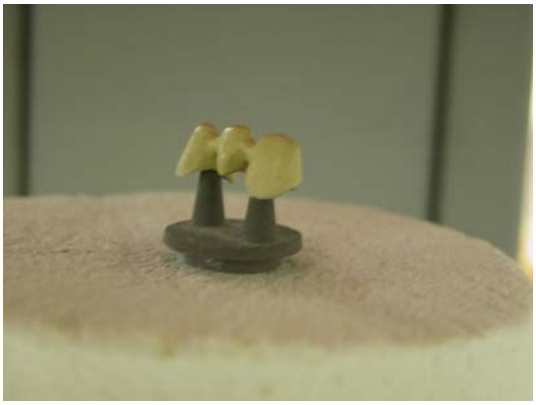
(40) Casting on original master model - a perfect fit

(41) Casting after oxidation

(42) Mixing masking ceramic

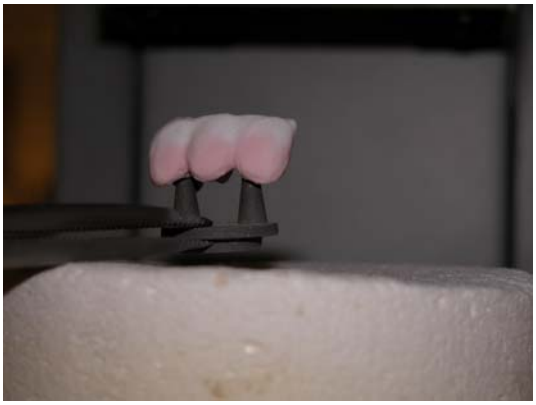


(43) Applying masking ceramic



(44) Post fire of masking out ceramic

(45) Applying incisal porcelain on dentine porcelain and



(46) Firing porcelain

(47) Grinding final porcelain finish

(48) Applying glaze

(49) Finished 3-unit bridge on master model

(50) 3-unit bridge detail in artificial light

(51) Detail showing natural reflectivity

(52) Detail showing natural translucency

(53) 3-unit bridge detail in natural light

(54) Actual 9-unit bridge now in-situ in the patient